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CONSTRUCTING COVER FOR CONDUIT, LOS ANGELES AQUEDUCT

THE LOS ANGELES AQUEDUCT

Will Be Completed a Year Ahead of Time — Concrete Lining to Conduits and Tunnels — Safety Appliances in Tunnel Work — Rapid Tunneling — Cheaper Than Open Cuts

By EDWARD P. BAILEY

UNEXPECTED progress is being made in the Owens river aqueduct, which is to furnish water and power to Los Angeles, Cal., and officials state that it will be completed within two years, or a year ahead of the date originally announced. The excellent time which is being made in the construction is no doubt due to the preparations which were well under way before any actual construction work was begun. A thorough study was first made of the nature of the country through which the aqueduct was to run; the possibilities of obtaining power were carefully considered; over 300 miles of road had to be constructed at a cost ranging from \$100 to \$5,000 per mile; water was necessary to supply the many camps, for which wells were sunk, springs were tapped, and in all about 40 miles of pipe line were laid to properly care for the power plants, men and beasts employed on the work. As a consequence, the care that was taken at the beginning is apparent in the fine progress which is now being made.

The total length of the aqueduct is 217.56 miles of which 41.57 miles are tunnels through the mountains, 100 miles are

covered conduits, 41.57 miles are open-lined conduits; the steel siphon work will be 11.41 miles in length, the concrete flumes a little less than 1,000 feet and the main canal in the Owens River valley about twenty-one miles long. All of the aqueduct tunnels are being lined with concrete; the lining to vary in thickness from 6 to 14 inches. Timbering is employed only where necessary to protect the workmen against falling rock and in swelling or loose ground. It is impossible to predict the amount of this timber which will be required. In illustration, the Elizabeth tunnel, which is being driven from both ends, requires timbering continuously at the north end, while the south end, where the rock is gneiss, has required little timber.

The aqueduct tunnels may be classified broadly as hard rock and soft rock tunnels. In order to keep well within the estimate of time for the completion of the aqueduct, work on sections where tunnels of the hard rock classification are found, is being started as soon as the preliminary construction will permit, as progress in this material is necessarily slower. In the

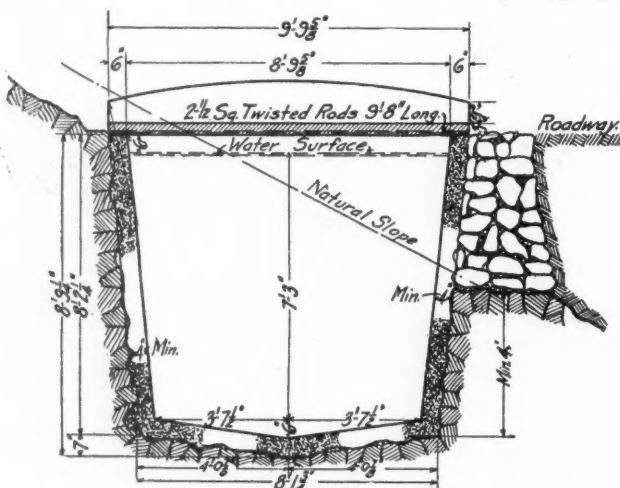


STEAM SHOVEL EXCAVATING FOR CONDUIT

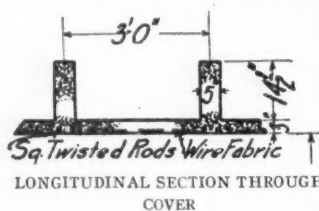
shorter tunnels the drilling is being done by hand, but in the longer drilling machines are used. These are operated by compressed air and as they require an expensive plant, are economical only in long tunnels.

LINED CANAL

The bulk of the excavation for the lined canal is being done with power shovels. This is especially true of the divisions known as the Rose Valley, Freeman, Section 1 of Jawbone, Mojave and Antelope. In sections 2 and 3 of Jawbone and in the Grapevine division the canal is located on steep, rocky



ROCK BENCH CONDUIT SECTION FOR SLOPE OF .0012

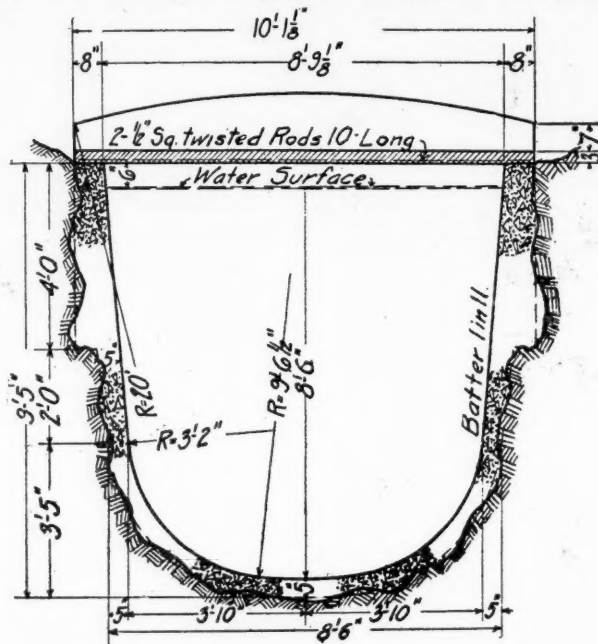


hillside and is termed rock bench conduit. In the major portion of this work blasting must be employed and some of the loosened material below the water line of the canal may have to be removed by hand. The gravel and sand required for the concrete are, in most instances, procurable from sources near the work. There are stretches of conduit, however, several miles in length where concrete materials must be hauled a distance of three to five miles.

SIPHONS

The siphons, so called, will be inverted, or U-shaped pressure pipes which will carry the water across canyons or valleys. These are used only where they are more economical than it would be to build a canal following the contour around the depression. This latter distance is often from three to seven times as great as the length of the pipe. The siphons will be constructed of steel pipe made from steel plates. The minimum thickness of the plates will be one-fourth of an inch, while the maximum thickness will vary with the hydraulic pressure. The maximum thickness of riveted pipe that can be constructed economically is assumed to be one inch. In one

instance, that of the Jawbone Canyon siphon, this requires reducing the pipe on the floor of the canyon to 7 feet in diameter, in order to keep the thickness within the prescribed maximum of one inch. Sufficient grade has been allotted to this siphon to permit reducing the size and increasing the velocity, the diameter near the ends being ten feet and changing by gradual steps to nine, eight and seven feet. The Jawbone siphon will have the highest pressure of any siphon on the aqueduct and is the most expensive type of main conduit construction per foot, with the possible exception of the Elizabeth tunnel. The total length of pipe in the Jawbone siphon is 8,365 feet. The estimated cost is about \$335,000 or an average of \$40 per lineal foot. The total length of siphons on the aqueduct will be about

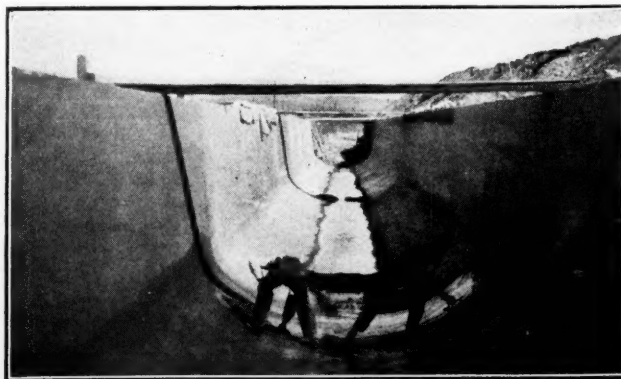


CONDUIT SECTION IN OPEN CUT FOR SLOPE OF .001

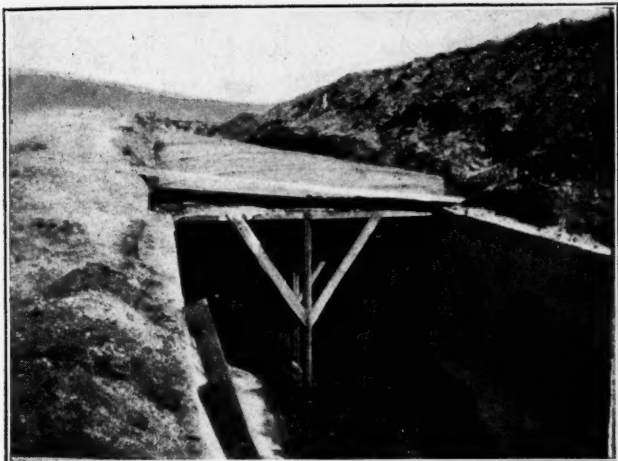
74,847 lineal feet. The estimated weight of steel required is 18,150 tons. While an enormous quantity of steel is required for all the siphons, the length of time it will take to construct them is relatively short; no one siphon requiring more than 18 months' time to construct, and the majority being capable of being built in less than three months. In order to avoid paying unnecessary interest on bonds, the construction of the siphons is being left until the last two years of construction.

FLUMES

The flumes of the aqueduct are located over shallow depressions where the maximum depth is not more than 30 to 40 feet. Most of the flumes will be fabricated from steel in the shape of rolled plates and angle bars so riveted together as to form an effective canal section and at the same time the sides act as a plate girder bridge to support the weight. Flumes will also be constructed of reinforced concrete instead of steel where the cost of forms is not excessive. This is the case in narrow canyons between portals of two successive tunnels. The



PLASTERING CONCRETE LINING NEAR MOJAVE

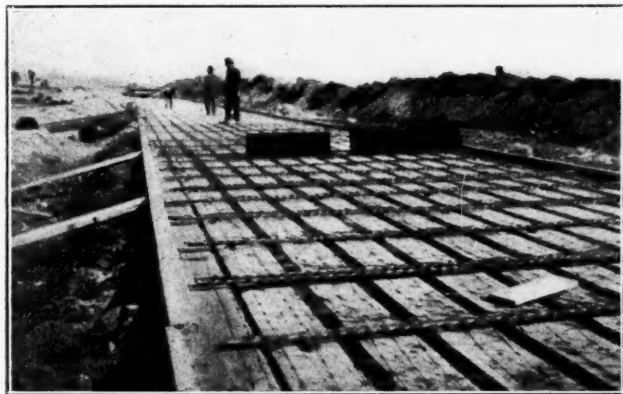


SUPPORTS FOR FORMS FOR COVER

tunnel dump will fill up the canyon to within a few feet of the bottom of the flume and thus eliminate the necessity of expensive centering.

TUNNELS

The Elizabeth tunnel, which is the most prominent feature of this division, is 26,860 feet in length, or a little over five miles. To date 18,690 feet have been completed. Two gangs of men are at work on this tunnel, one at the north portal and one at the south portal. During the month of March, 1,064 feet were driven, or on an average of 34 feet per day. In Oc-



REINFORCEMENT FOR CONDUIT COVER

tober of last year the workmen in the north portal excavated 547 feet, which is the American record for hard rock tunnels. It is expected to have this important piece of work completed by the first of next year. The size of the tunnel is 9.5 feet wide by 11 feet high, inside measurements, the lining being eight inches thickness of concrete.

The work has been done at an average cost of \$39 a foot, while the estimate of the board of engineers was \$46 a foot. This represents a saving on the whole job of \$119,000. From an engineering standpoint one of the most interesting features in the construction of the aqueduct is that the original plans



COMPLETED COVERED CONDUIT, LOS ANGELES AQUEDUCT

called for 15 miles of tunnel and the finished product will contain 45 miles. The interest lies in the fact that it has been found cheaper and better to bore tunnels than to work through the open cuts.

At the entrance to the tunnels a number of safety devices have been installed. At the left of the tunnel is a big pipe leading into the tunnel, which supplies pure air to every part of it. A powerful fan located in the power house draws the air through a high stack which rises above the dust and forces it into the mine. The pipe serves a two-fold purpose, as immediately after blasts have been exploded, and before the men re-enter the tunnel, the fan is reversed and the smoke and vapor are pumped out of the tunnel.

Formerly in blasting operations in the tunnels ordinary nitroglycerine blasting power was used, the fumes from which



SOUTH PORTAL ELIZABETH TUNNEL

often cause intense headaches, some miners becoming so susceptible to it that the mere handling of dynamite will bring on aches and pains. Long exposure to the fumes sometimes causes symptoms like those of sunstroke. Complaints of headaches among the miners along the aqueduct were frequent as long as nitro powders were used, and as an experiment the aqueduct officials purchased a small amount of a new blasting powder, called ammonia powder. This was found to give highly satisfactory results and not to cause headaches, and it has displaced the nitro powder in all the tunnels where blasting is now being done.



INTERIOR OF ELIZABETH TUNNEL

Another danger to which the men were constantly exposed was from explosive gases which were constantly accumulating in the tunnels. No explosion of these has ever taken place on the aqueduct, but the danger was constantly there, nevertheless. Although all the tunnels are brilliantly lighted with incandescent lights, another measure for the good of the men, it has been found impossible to dispense with the old-fashioned candles in working at the headings of the tunnels. The use of naked flames, therefore, was a constant menace. Recently the electrical department of the aqueduct devised a tiny machine, operated by electricity, which gives off sparks at regular, frequent intervals. These machines are installed along the tunnels, burning the gases as rapidly as they form and before they accumulate in dangerous quantities.

Cave-ins have been prevented in many of the tunnels only by extreme caution and constant watchfulness. The engineers have concluded from studying and observing the conditions they have encountered that the force which breaks the large beams with which the tunnels are timbered arises not so much from the weight of earth and rocks above, as from some action taking place therein. They believe that when the earth and rock is exposed to air and dampness a process of absorption causes it to swell rapidly. In each of the tunnels there are men whose sole business is to watch the conditions of sides and top and forestall any threatened break. The completed work includes 33.6 miles of tunnel excavating; 13.8 miles of tunnel lining; 41.8 miles of covered conduit excavating; 33 miles of conduit lining; 7.8 miles of open canal work, and a very small percentage of the uncovered conduit and steel siphon work, this last having just been begun. This makes about 60 per cent of the excavation fully completed and 26 per cent of the lining.

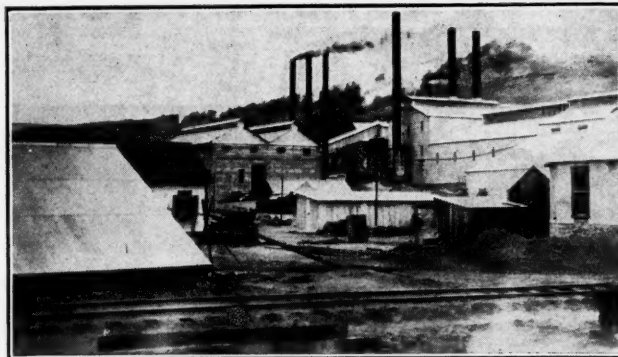


SOUTH PORTAL, TUNNEL NO. 18

Work has never been progressing in a more satisfactory manner than at the present time. There are 3,800 men employed, divided into 55 construction camps of from 50 to 150 men to each camp. These camps are divided into 12 divisions, each in charge of an engineer. The monthly pay-roll is approximately \$302,000 which is an average of about \$2.60 per capita daily.

A private telephone system, costing an average of \$170 per mile, has been established along the entire aqueduct, connecting all sections from the headgates near Independence to Saugus, and extending to the administration headquarters in the Central Building in this city. Thus no time is lost in communicating between the several departments. Electric energy is developed in the valley, power plants having been established at Division Creek No. 2 and at Cottonwood Creek; from which stations ample power and light are transmitted to all parts of the aqueduct system with no expense but maintenance.

The cement mill at aqueduct has been in operation now nearly a year and is turning out on an average of 800 barrels of



CEMENT WORKS, LOS ANGELES AQUEDUCT

cement per day, the capacity of the mill being 1,000 barrels daily. The cost of equipment for this mill and power plant was about \$267,000. The cement turned out by it has proved of good quality, meeting with the requirements of the engineers, and from both laboratory tests and its use in construction work has been pronounced safe for use on this work. At the rapid rate at which work is being done it is necessary to import from 5,000 to 10,000 barrels of cement monthly in addition to that made at the aqueduct plant.

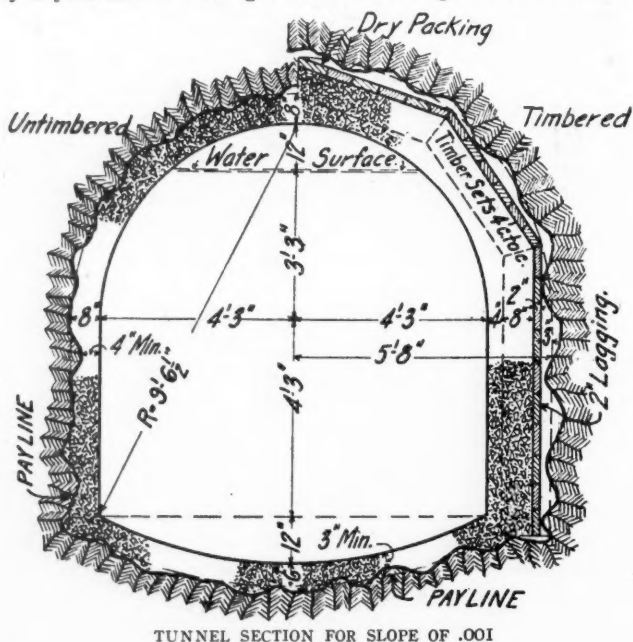
Two of the most important sections of the system now under construction are the great Haiwee dam and the Elizabeth tunnel. The Haiwee dam will be one of the largest in the country, containing approximately 750,000 cubic yards of material and will require one year to complete.

CONCAVE ROADWAYS

THERE has been some discussion recently, in one or more of the English technical papers as to the desirability of building roadways concave instead of convex; there being one gutter (in the middle of the roadway) rather than two, as is the common practice. A recent article summarizes the advantages of this construction under the following heads: 1. Economy in first cost, (a) In the construction of one gutter instead of two, although this would be somewhat balanced by the pavement replacing it; (b) Dividing the number of catch-basins by two and largely eliminating the catch-basin connections. 2. Economy in maintenance and cleaning caused by: (a) More uniform wear and consequent longer life, because the traffic will be distributed rather than all traveling on the crown and wearing this into mud holes; (b) A saving in cleaning would also be effected because the dirt would be collected in one row of piles instead of two. 3. Other advantages are the diversion of traffic to its proper side; possibility of completing repairs on one side while the other is kept open; and less likelihood of mud splashing on pedestrians and of complaints of odors from catch basins.

The most serious objection, according to the article in question, is the difficulty of construction on side hills, where at present the street is sometimes given a continuous slope to the lower gutter, which would be impossible if the gutter were in the center and each curb must be higher than it. Another objection is the drainage of water to street car lines in the center of the roadway, objectionable not only to the company, but also to the city, because of the disintegration of pavement along the rails. A similar difficulty would occur in connection with maintaining pavement along the edge of the gutter, the writer believing there would be more travel to produce wear here than along side gutters. Greater scour would occur, due to the flow over the roadway of the run-off from the entire street area. Greater liability to side-slip or skid when rounding corners. Sewer manholes could not be placed in the center of the roadway, and isles of refuge, etc., would interfere with the drainage. Difficulty of providing crossings for pedestrians when the gutter is flowing full. Greater difficulty theoretically in properly rolling a concave surface.

The writer of the article believed that if a concave road is applicable to any pavements it would be wood block, asphalt and similar roads.



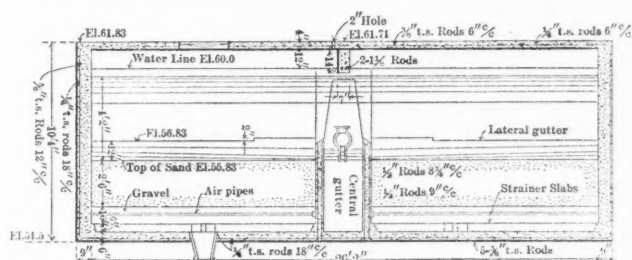
TUNNEL SECTION FOR SLOPE OF .001

WATER TREATMENT AT COLUMBUS

Filter Construction—Strainer System—Chemicals Used—
Difficulties in Operation—Results Obtained
—Clogging of Meters

(Concluded from page 660.)

THE present installation includes 10 filters, each with a normal capacity of 3 million gallons per 24 hours. These are divided into two sets by a pipe gallery, above which is the operating floor. Each filter tank is constructed as a monolith, with inside dimensions of 26 ft. 2 inches by 46 ft. 8 in. by 8 ft. 10½ inches deep at the center; the net filtering area of each being 0.025 acre. Down the middle of each tank is a gutter 1 foot 10 inches wide and 4 feet 10 inches deep, on each side of which are six lateral gutters 7 feet 9 inches from center to center. These are for carrying off the wash water and are suspended with their edges one foot above the top of the sand. The filtered water is removed and wash water enters through strainers, of which there are eight units in each filter. The water passages of each unit consist of a series of lateral channels connecting with a main collector and built monolithic in the floor of the tank. The strainers consist of circular brass plates, number 16 B. & S. gauge, depressed at the center and pierced with 45 1/16-inch holes. Each strainer is bedded in a thin paste of red lead and is held in place by a brass bolt and a brass clip, the latter being held in the strainer slab. There are 2,048 strainers in each filter giving a total area of holes

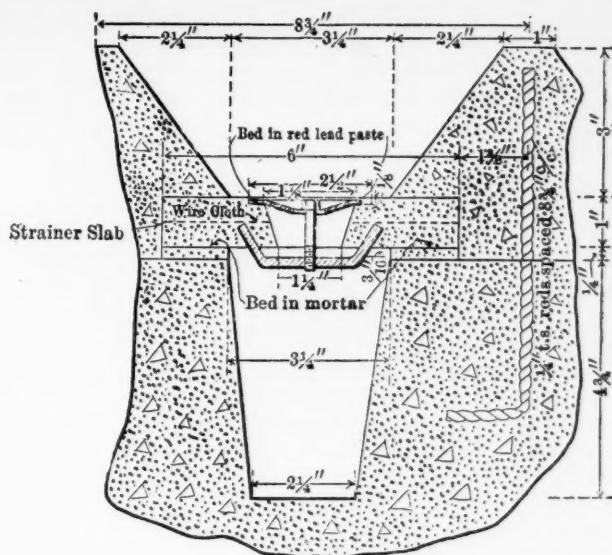


SECTION OF FILTER BED

in one filter of 1.96 square feet or 0.18 per cent of the filtering area. The effluent pipe below the filter is so arranged that the friction loss from the outlet at the center of each of the eight units to the main effluent pipe is the same. Provision for the use of air in washing the filters is made by a 10-inch cast-iron air pipe supported above the central gutter, from which branch pipes extend through the walls of this and connect with lateral air pipes in the filters. These lateral air pipes are 8¾ inches apart, one inch outside diameter and drilled on the underside with 1/8-inch holes 8¾ inches apart. Excepting the 10-inch main, all air pipes are brass. They are designed to provide 3 cubic feet of free air per square foot per minute.

The air used in washing the filters is furnished by a Bury air compressor having a rated capacity of 100 cubic feet of free air per minute, compressed to a Gage pressure of 60 pounds per inch and driven by a 15-hp, 220-volt Croker-Wheeler motor. The compressed air is stored in three tanks supported in the roof trusses of the saturator house, each tank being 6 feet in diameter and 30 feet long, of one-fourth inch riveted steel plates. It is conducted from these to the filter gallery by an 8-inch air pipe in which is a Foster pressure reducing valve which maintains a constant pressure of from 2 to 4 pounds per square inch as may be desired. This provides for sufficient air to permit washing a filter for three minutes to every 1¾ hours at a maximum rate of 3 cubic feet per square foot per minute.

In the filter was placed 10 inches of gravel and 2 feet 6 inches of sand. The gravel was brought from Cape May, N. J., and the sand was furnished by the Millwood White Sand Company of Millwood, Ohio. The gravel is in four layers, the particles in the bottom layer being from one inch to one-



SECTION THROUGH COLLECTOR OF STRAINER SYSTEM

half inch in diameter, the next layer from one-half to one-fourth inch, the third from one-fourth to one-eighth and the top layer from one-eighth to one-sixteenth inch. The filter sand has an effective size of 0.415 m.m. and a uniformity coefficient of 1.36.

All the main pipes in the pipe gallery are of cast iron except the 48-inch one bringing the water to the filters, which is of riveted steel. The small pipe is of wrought iron, brass, or lead, depending on the service. The valves used in connection with the filters are all hydraulically operated. On the operating floor in front of each filter is a marble operating table on which are indicators showing the position of each valve, a loss-of-head gauge showing the elevation of water on the filter and in the effluent pipe, and other standard appliances. Two small electrically driven centrifugal pumps can be used for raising samples of settled and of filtered water into a bowl on the operating table.

The discharge of each filter is controlled by a filter controller which maintains automatically a uniform rate of filtration. This controller requires no auxiliary device for its operation and acts under a net loss of head of about one foot. It has a capacity ranging from a minimum of one million to a maximum of 4,500,000 gallons per 24 hours. A small controller is placed on the wash water pipe to control the rate of application of wash water, its maximum capacity being 16 million gallons per 24 hours; or the wash water can be controlled by hand at the operating table. The air pressure is maintained constant by a pressure reducing valve and the amount of air is controlled by a gate valve.

A gauge board contains recording gauges showing the level of water in the wash water tank, pressure of air in the air tanks and that in the main air pipe; also four glass tubes through which river water, softened water, settled water and filtered water are continually passing, being supplied by small pumps in the pipe gallery below.

There are two covered filtered water reservoirs of the groined arch type, each 219 feet 10 inches long, 214 feet 3 inches wide and 15 feet 10 inches deep with a capacity of approximately 5 million gallons.

Between the pumping station and the saturator house is an elevated tank for holding wash water, which is 42 feet in diameter and 11 feet deep with a capacity of 104,000 gallons, the floor of the tank being about 24 feet above the ground. The tank and supporting columns are of reinforced concrete throughout.

Altogether there were used in the plant about 39,560 cubic yards of concrete which cost an average of \$7.27 per cubic yard. The footings, foundations, lateral dividing and baffle walls were mixed 1:3:7; the columns and piers, reservoirs, basins and walls in general were mixed 1:2½:5½; reinforced

floors, stairways, filter, solution, dissolving and wash water tanks, and water tables and the like were mixed 1:2:4. Ordinarily the concrete was mixed very wet. The coarse aggregate was screened into three sizes, and ordinarily all three were used, but in some thin vertical work, walls, etc., only the smallest (between one-fourth and three-fourth inch) was used. Expansion joints were built where necessary. Where subject to the action of water which has been treated with lime and soda, the expansion joint consisted of a tongue and groove in the concrete, with a steel plate bedded and anchored on one side of the joint and greased on the other; in other places the tongue and groove only was used.

The water purification works, pumping station and connections and cast-iron force main were furnished and built by contract by Westwater and Casey; the machinery and equipment were furnished by the Holly Manufacturing Company. The total cost of the entire plant was \$1,333,570; of which land cost \$48,410, pumping station \$399,240; purifications works \$532,480 and other work \$76,490. Connections to the city cost \$181,000 and engineering \$95,950. The pumping station building cost 10.1 cents per cubic foot; the main buildings 9.2 cents per cubic foot; filter gravel \$6.83 per cubic yard; filter sand \$6.90 per cubic yard.

The chemicals used at Columbus are "quick" or fresh burned lime, soda ash, and sulphate of alumina or sulphate of iron. The purpose of the lime is to absorb the excess of carbonic acid gas, which holds the carbonate of lime and magnesium in solution in the river water and at the same time to remove free carbonic acid gas, if present. When the reaction takes place the newly formed carbonate of lime, together with the carbonate of lime liberated by the removal of the carbonic acid gas, is largely precipitated. It is necessary to make a further addition of lime to convert the magnesium (now in the form of a normal carbonate, which is a more soluble salt than the corresponding carbonate of lime) to the insoluble hydrate. Although, for most purposes, the carbonates of lime and magnesia may be considered insoluble, yet in the excessively dilute condition which is maintained in a water-softening plant they are soluble to the extent of about 40 parts per million.

The soda ash is added to precipitate the other soluble salts of lime and magnesia, namely, the sulphates, chlorides and nitrates of these metals, as normal carbonates of lime and magnesia. At the same time there are formed, and remain in the water, sodium sulphate, chloride, and nitrate, but the presence of these salts is not objectionable.

Columbus is the first city to use soda ash on as large a scale as 30,000,000 gallons per day. The removal of magnesium has not ordinarily been attempted in city water softening plants heretofore, but the results obtained at Columbus have demonstrated that the magnesium, sulphates and carbonates can be removed without difficulty at all seasons of the year, provided the softening chemicals are applied properly and the operation of the plant is watched by trained men.

The operation of the above-described plant has been attended with a number of difficulties, some of which were not foreseen. One of these is that of obtaining lime which is constant in composition and which does not contain large quantities of unburned rock, cinders, bricks, etc., these often amounting to from 10 to 20 per cent of the entire amount. The soda and coagulant solutions do not carry much foreign matter, except fine hairs from the jute or burlap sacks in which they are shipped, which form mats over the screens. The intercepting of these materials before reaching the filters and removal of them is secured by the use of additional fine removable screens and large drain pipes for flushing out the large matters in the lime.

In addition to these foreign matters, deposits of chemicals accumulate wherever they may find a chance to lodge, as in elbows, valves, measuring devices, etc., such deposits having caused frequent and annoying interruptions in the lime feed at Columbus. Lime, soda and sulphate of iron solutions form calcareous, crystalline and scaly deposits, which rapidly choke the delivery pipes. For example an 8-inch cast-iron lime water

RECORD OF OPERATION OF COLUMBUS WATER PURIFICATION PLANT DURING EIGHT MONTHS OF 1909
Averages by Months of Daily Records

MONTH	Temperature of Air, in Degrees Fahr.		Temperature of Water, in Degrees Fahr.		VOLUME OF WATER	FILTER DATA					APPLIED CHEMICALS										ANALYTICAL RESULTS, IN PARTS PER MILLION										BACTERIOLOGICAL TESTS																
	Pumped, ¹ Million Gal.	Filtered, Million Gal.	Number Used	Hours in Service, Average		Loss of Head, Maximum, in Feet	Wash-water, Percentage.	Use of Air, Days	Pounds			Grains per Gallon			Color		Turbidity		Total Hardness			Total Alkalinity			Caustic alk.		Incrustants			Magnesium	Bacteria per c. c.		Presumptive <i>Coli</i> Tests, Positive														
									Lime	Soda Ash	Coagulant	Lime	Soda Ash	Coagulant	River Water	Filtered Water	River Water	Settled Water	Filtered Water	River Water	Inlet to Set. Basin	Settled Water	Filtered Water	River Water	Inlet to Set. Basin	Settled Water	Filtered Water	River Water	Inlet to Set. Basin		Settled Water	Filtered Water	River Water	Settled Water	Filtered Water	Smith Method	Bile Method	Smith Method	Bile Method	Smith Method	Bile Method						
January...	32	34	15.0	14.3	10	19.6	5.7	2.4	31.164	16,795	105	14.6	7.8	0.05	16	0.4	7	...	0	5	417	121	125	109	233	60	56	43	16	5	11	31	184	61	69	66	42	12	435	11	3	3	1	0	0	0	
February...	35	37	14.8	14.1	10	18.6	7.1	5.4	0	19,472	13,626	3,955	9.1	6.6	1.8	54	7	256	...	0.5	3	288	137	131	105	149	98	74	51	31	5	8	32	139	40	58	55	27	10	32,825	2,146	82	15	14	1	0	5
March...	39	42	14.0	12.9	10	17.9	4.1	5.2	0	12,855	12,128	3,985	6.4	6.1	2.0	56	9	109	17	0.4	3	241	128	99	82	119	99	61	47	17	2	4	35	122	29	38	35	17	8	18,228	828	81	13	14	1	0	6
April...	50	50	12.7	11.9	10	18.0	6.4	3.7	0	11,951	10,290	4,386	6.5	5.7	2.4	43	8	102	21	0	3	242	112	92	84	131	79	53	46	13	0.3	0.1	28	111	34	38	38	19	10	8,500	8,662	264	15	9	0	1	3
May...	60	60	13.2	12.4	10	20.1	7.6	5.5	0	13,206	6,459	7,173	7.0	3.4	3.9	53	11	196	28	0	3	188	101	92	83	117	71	54	40	9	2	0.3	24	71	29	38	43	15	7	16,309	3,523	718	22	25	1	0	3
June...	72	72	13.8	13.3	9	21.0	7.1	2.5	0	13,231	3,425	3,728	6.7	1.7	1.9	78	18	92	14	0	3	211	102	96	85	139	52	47	37	2	0.1	0.4	32	72	50	49	49	15	8	3,952	180	121	18	25	0	0	2
July...	72	74	14.1	13.6	9	19.8	4.0	3.2	0	13,765	914	3,598	6.8	0.4	1.8	54	13	86	10	0	3	192	94	92	86	139	42	38	32	2	0.4	0.1	27	53	52	54	54	15	8	4,009	42	13	26	28	0	0	0
August...	72	75	15.2	14.3	9	20.2	4.3	3.3	0	14,767	1,208	1,810	6.8	0.5	0.8	31	8	24	4	0	3	221	101	99	92	156	43	41	35	1.4	0.2	0.3	28	65	58	58	58	19	10	7,888	83	29	22	12	0	0	0

pipe was reduced in diameter in two weeks to such an extent that a 2-inch pipe could not be passed through the opening left. A 3-inch lead-lined coagulant pipe was reduced by flakes of iron rust to $\frac{1}{4}$ -inch opening in many places. The latter pipes were unfortunately bedded in concrete and submerged under water, which makes the cleaning of them a difficult matter. The coagulant solutions have eaten the steel pipes wherever the lead lining is broken, as at joints. The suspended foreign matters carried by the milk of lime cut the edges of orifice plates, screens and valve seats. The soda solution attacks concrete, dissolving out the calcium sulphate and leaving the sand and gravel, which makes the walls of the concrete tanks rough. The acid carried by the sulphates of iron and alumina solutions dissolves the carbonates out of the concrete tanks, eats the iron pins out of the valves, and, in fact, is destructive to all metals except lead, although brass pipes resist it well.

Most of the sludge settles in the first two settling basins, a mass from 12 to 15 feet deep forming near the inlet ends in three or four weeks. The depth falls off rapidly to four or five feet at the outlet end of these first basins, and in the other only about three or four feet collects in a year's time.

In the matter of applying coagulant it has been found that the best efficiency is obtained by adding most of this to the raw water as it enters the plant, and a small additional dose to the settled water as it passes to the filters. The first is because the later addition of caustic lime to the coagulated water causes the coagulant to precipitate more freely in large blocks. The second application of coagulant is to form the coagulant mat on the surface of the filters for straining out bacteria and the finer suspended matters.

Compressed air was used in washing the beds during the first few months of operation, but as equally good results appear to have been obtained without its use, this has been discontinued. It is found that the upward velocity of wash water of 10 inches per minute, which was planned for in the design, was somewhat too great, as it would lift the sand up and carry it away through the gutters; consequently the rate actually secured does not exceed six or eight inches.

Another difficulty experienced was in connection with water meters. Some months after the starting of the plant the city meter inspectors noticed that a number of meters were not registering the flow of water correctly. On examination the meters were found to be clogged with a slimy white deposit which interfered with the rotation of the disks. Later the trouble subsided to some extent, but because of it a series of studies has recently been made for the purpose of discovering the extent and nature of the action of softened water on metals. The results of this study may be summarized as follows:

First—It is established that water softened by lime and soda and coagulated by alum or iron will appreciably attack zinc, black iron and galvanized iron, and form heavy deposits.

Second—In the case of zinc and galvanized iron, the deposits are similar in composition, and consist of about 90 per cent of normal or basic carbonate of zinc.

Third—Other salts present in the water in large quantities, such as carbonate of lime and magnesium, and sodium sulphate, are also present in the deposits to an appreciable extent, and are probably carried down by mechanical action.

Fourth—Lead is practically unaffected, undergoing surface oxidation only, but receiving no deposit.

Fifth—Black-iron pipe is heavily oxidized, copious deposits of iron oxide being formed and settling out to form a heavy sludge.

Sixth—The dissolved oxygen in the water appears to have a corrosive action on the metals, which is added by a carbonation, secured, first, either from the carbonic acid gas in the air, which is sufficient to form a normal or basic carbonate, but not sufficient to carry the deposit back into solution as bicarbonate; or, second, from the normal carbonates present in the filtered water, which are precipitated out as insoluble carbonate of zinc. No reduction in normal carbonates in the water that had passed over the metals could be detected, but so small a quantity as was taken for titration, namely, 100 cu. cm., would not bring out the difference.

Seventh—A distilled water containing normal carbonate of lime forms deposits, indicating that this salt is a factor in the formation of deposits.

Eighth—The same is true of carbonate of magnesium, to a less extent.

Ninth—The presence of considerable amounts of sodium sulphate in the water does not appreciably affect the deposits.

Tenth—Water containing considerable amounts of caustic favor the reduction of deposits.

Eleventh—Sodium bicarbonate used as a chemical for the reduction of incrustants in water—that is, chlorides, sulphates and

nitrate of lime and magnesium, is no more nor less efficient than the normal carbonate of soda. Used as a chemical for the reduction of normal carbonates by the liberation of carbonic acid gas, it is efficient to the extent of about 20 parts per million. Used as a chemical for the prevention of deposits in pipes, it is unsatisfactory, reducing the deposits appreciably, but not eliminating them.

Twelfth—Carbonation of the water is an efficient means of preventing the formation of deposits, but when used in sufficient amount the metals are attacked to an appreciable extent by the presence of free carbonic acid gas in the water.

When the river water is very hard, high bacterial efficiency is obtained by adding very little or no coagulant. The precipitate of magnesium hydrate is gelatinous, and shows about the same degree of efficiency in removal of bacteria as the hydrate precipitates of iron and alumina. The number of bacteria in the river water in 1909 averaged 9,240 per cu. cm., in the settled water 664, and in the filtered water 120, or a 92.8 per cent removal in the settling basin and an additional 5.9 per cent in the filters. It was found that there was an enormous development of a species of bacteria in the lime sludge, the sludge being found to contain about five or six million of these per gram. As many of these passed through the filters, the bacterial content of the final effluent sometimes being higher than that of the applied river water, calcium hypochlorite has been used to sterilize the effluent. On 12 occasions during the year it was possible to isolate the coli bacillus from one cu. cm. of filtered water, and from 50 cu. cm. portions coli were isolated on 26 different days. They were found in one cu. cm. portions of river water 71 per cent of the time.

The accompanying table outlines the operation of the filters during 1909, giving the averages for each month.

SEWAGE DISPOSAL BY DILUTION

Natural Processes by Which Sewage-Polluted Waters Purify Themselves—Sedimentation—Oxidation—As Food for Organisms—Reoxidation of Water

AN unusually instructive report on sewage disposal has just been submitted by Mr. Emil Kuichling to the city of Rochester, as supplementary to one made in 1907 on the same subject. This advocates dilution in Lake Ontario, and adduces evidence from various sources in support thereof. As it represents the ideas of some of the most prominent experts on the subject, we give the argument in full, so far as it relates to the general proposition; omitting the application of the principles to the specific case of Rochester. In a following number we will give Mr. Kuichling's excellent summary of the existing data—much of it new to most American engineers—concerning sewage screening and other methods of treatment preparatory to dilution.

When crude sewage is discharged into a large body of relatively clean and quiet water, most of the suspended matter, both mineral and organic, settles to the bottom within a few hours. This sedimentation likewise applies to the bacteria and other micro-organisms, as they are generally a little heavier than their bulk of water. It must also be remembered that their powers of locomotion are very limited, and that they are seldom found at considerable distances from the dead organic matter which is their chief source of food supply. If they are transported by currents far away from such matter, they soon die of starvation.

The relatively clean water, moreover, contains a multitude of other living organisms, which depend for food upon both the living and the dead organic matter of the sewage, and when such food supply is abundant, these other organisms will multiply in number unless prevented by conditions adverse to their existence, such as excess of finely divided mineral matter, detrimental trade wastes, lack of oxygen dissolved in the water, etc. The adverse conditions, however, are generally limited in both duration and extent of influence, so that the consumption of the unstable organic matter contained in the sewage practically continues incessantly either at or not far from the point where the sewage is discharged.

It was stated above that most of the suspended matter in the sewage settles comparatively quickly when the water is quiescent. This sediment consists of a mixture of mineral matter with the more or less putrescible organic matter, and the bacterial decomposition of the latter is then either retarded, or is replaced by the action of protozoa and more highly developed animal organisms, the result being the gradual elimination of the putrescible matter. If the temperature of the water is low, such as prevails at considerable depth, the decomposition is probably accomplished mainly by animal agency and without the evolution of offensive gases. The discharge of the sewage by means of a long submerged pipe directly upon the bottom of a large body of water, and at a point where the water is about 50 feet deep and practically quiescent at all times, may thus lead to the accumulation of a large quantity of such sediment without the usual phenomena of putrefaction or the extensive contamination of the surrounding water.

The changes indicated above in the composition of the organic matter are furthermore dependent in a large measure on the quantity of atmospheric oxygen that is dissolved in both the sewage and the relatively clean water into which the sewage is discharged. A portion of this oxygen is gradually abstracted from the liquid directly by the easily oxidizable organic substances, and another portion is taken up by some of the living organisms, especially the water bacteria, through whose agency the ammonium compounds and the greater part of the organic constituents of the sewage are oxidized. The oxygen thus abstracted, however, is replaced more or less slowly by the absorption of a fresh supply from the air at the surface of the water or sewage, and it has recently been found that if the rate of pollution is somewhat less than the rate at which the water will reabsorb oxygen from the atmosphere, no offensive products of fermentation or organic decomposition will appear.

Fresh water that is fully aerated contains at ordinary temperature and barometric pressure, about 10 milligrams of dissolved oxygen per litre of water, or about 83 pounds per million gallons. If this oxygen be wholly removed by boiling or otherwise, the water will reabsorb a fresh supply from the atmosphere at the rate of from 0.3 to 0.6 milligrams per litre hour, or from 2.5 to 5.0 pounds per million gallons per hour. It is also found from a few recent experiments by Prof. Adeney of Dublin, that the oxygen thus absorbed at the surface of the water is diffused quite rapidly through the mass of the liquid, reaching a depth of 6 feet at about one-tenth of the last mentioned rate, or from 0.25 to 0.50 pound per million gallons per hour. These laboratory investigations seem to be entirely novel in character, and other observations indicate a strong probability that in natural bodies of water the rates of absorption and diffusion of atmospheric oxygen are considerably larger.

In regard to the quantity of oxygen that is needed to oxidize quickly the putrescible portion of the organic matter carried in the sewage in both solution and suspension, little appears to be known definitely, owing to the difficulty of separating these substances from the rest; but as they constitute only a small fraction of the entire amount of organic matter in the sample, it may be inferred that a similar fraction of the total quantity of oxygen required to completely oxidize all the organic matter will be needed. There is still much obscurity in this part of the subject, and it can only be said at the present time that long experience has demonstrated that offensive products of fermentation are not apt to develop when town sewage is diluted by admixture with from 20 to 40 times its volume of well-aerated fresh water. It is also known that after standing 24 hours in a closed vessel the mixture will still contain more than two-thirds of its original dissolved oxygen, and would probably contain somewhat more if it had remained in contact with the air; hence it is evident that after the comparatively small quantity of dissolved oxygen needed for the rapid oxidation of the putrescible organic matter has been abstracted from the water, the rate at which

oxygen is reabsorbed from the air is amply sufficient to provide that quantity which is necessary for the complete oxidation of the remaining organic matter without producing offensive conditions.

The various processes briefly outlined in the foregoing serve to explain why the great bodies of water on the surface of the earth have not become foul after having continued to receive for countless ages vast quantities of organic matter of every description. There is no evidence whatever that the quality of the water in our oceans and great lakes, a few miles from shore, has deteriorated, and traces of contamination can be detected only within comparatively short distances from the mouths of highly polluted rivers. Ample proof of this fact is afforded by the results of recent elaborate investigations at Cleveland, Chicago and other large cities on the shores of the Great Lakes. It must therefore be admitted that nature has provided efficient agencies for maintaining the purity of these bodies of water, and the same is also true for the smaller ones when the amount of contamination is proportional.

It may properly be asked whether this natural power of self-purification of the fresh water in our Great Lakes should not be utilized to accomplish the disposal of the sewage of the cities on their shores. It is similar to all other natural advantages and the prevention of its use within reasonable limits becomes oppressive. In the case under consideration, the price to be paid for such utilization is merely the possible extension of the area of lake surface which is already contaminated, naturally and uncontrollably, by the impure river water from the upland; and if the screened sewage is discharged into deep and relatively quiescent water as contemplated, it is difficult to imagine that such existing contaminated area will become materially enlarged.

ASPHALT BINDER IN NEW JERSEY

In a considerable part of the macadam constructed in New Jersey last year asphaltum binder was used with the second and top courses of broken stone; stone screenings and gravel being used as a binder on the bottom course. The second course consisted of 1½-inch stone rolled with a ten-ton roller, after which asphaltum binder was applied by means of a mechanical distributor, the specifications requiring that this should evenly distribute the asphaltum binder, regulate the width of distribution, control the quantity distributed and maintain the asphaltum at a uniform temperature. The quantity of asphaltum used on this second course was 1.2 gallons per square yard of surface, applied at a temperature of between 190 and 200 degrees F. After the application of the asphaltum, rolling was continued until the stone ceased to sink or creep in front of the roller; the wheels of the roller being kept constantly wet so that the asphalt or coated stones would not adhere to them during the rolling. Any depressions which formed during the rolling were filled with ¾ or 1½-inch stone mixed with asphalt binder, and additional asphalt was applied wherever necessary so that this material appeared uniformly over the entire surface.

Following this a top surface of ¾-inch stone was added, followed by another application of asphaltum binder to the amount of .3 gallons per square yard. After this had thoroughly penetrated the stone, stone dust was applied in sufficient quantity to fill the voids and the road was again rolled until it became thoroughly consolidated, hard and smooth. The contractor was required to use a ten-ton steam roller in this work; one giving a compressing power of not less than 400 pounds per lineal inch on the drivers.

The cost of these roads, all 8-inch, varied in different sections of the State between 70 cents and \$1.05; the majority being between 80 and 90 cents. Plain macadam of the same thickness cost from 62 to 99 cents, the average cost being about 80 cents. It would appear therefore from these figures that the use of asphalt binder in the place of screenings added about five or possibly ten cents per square yard to the cost.

PLANNING NEW CITY AREAS

Adoption and Development of Existing Highways as Controlling Features—Individuality Permitted Play in Intervening Spaces

By NELSON P. LEWIS, Chief Engineer
Board of Estimate and Apportionment, New York City

Condensed from paper before Rochester Conference on City Planning

In most American cities whose growth has been conspicuous it will be found that additions have from time to time been made by extension of the city limits or by consolidation with other cities. Frequently these additions have already been exploited by the suburban developer; streets have been laid out and certain improvements have been made. They are often so limited in area that it is difficult to do anything but extend the already established city plan over them or accept the street lines which may have been adopted by the village or town authorities or fixed by the real estate developer. It occasionally happens, as in the case of New York, that an extension of the city limits will include large areas where there are a number of centers of population, and that these centers are disconnected and could be absorbed in a larger city plan without serious detriment to the latter. Areas of this kind contiguous to a large city are almost invariably traversed by highways which have been established for many years and which follow natural lines of traffic. These old roads are the logical routes for transportation lines such as electric railroads, and they could, and it would be safe to say they should, be made the controlling features of the city plan. They are generally of the ordinary country road width, that is, three or four rods, and occasionally only two rods. This width will be totally inadequate to the important part which they should play in the ultimate city plan, but they are usually allowed to remain until they have been so built up as to make a widening very expensive.

In making a plan for the annexed territory it will be found that in most cases the street system of the older city is extended over the new addition, or the crude street plans of the several villages and towns which have been absorbed by the greater city are prolonged until the different layouts meet in a confusion of unrelated street lines without system or symmetry. Then, in order to make the plans fit together, it is likely that a street will be laid out upon which they can abut, but which has no other reason for its existence. In other words, the plan of the annexed territory is the result of an attempt to enlarge and expand the old city plan or those of the existing centers of population, with no effort to study the problem as a whole or to grasp the possibilities of the territory as an integral part of a great city.

What, then, is the logical method of procedure? Do we first need an accurate topographical map of the entire area? This involves a large expenditure of time and money which, in the judgment of the writer, could be expended to better advantage. Let us assume that the unmapped areas are extensive, as in the case of those which were added to The City of New York at the time of consolidation. The first thing which it is necessary to do is to be able to determine the relative position of the different parts of the new territory and the different existing highways with respect to the remaining portions. This can only be done by a triangulation, which will establish points whose precise relative positions will be known, these points being, say, not less than 2000 feet or more than 5000 feet apart. It will then be possible to proceed with our mapping and planning in widely separated sections of the new territory with a positive knowledge of the relation of the street lines which we will establish in one section to those which we are to lay down in another. The next thing which will demand our attention is the system of existing roads. There was, and is, a good reason for these roads. Their grades may be excessive in some places, but it is probable that their alignment has been sacrificed for easy grades at the time

when they were laid out, when improved roads were almost unknown and heavily laden vehicles were obliged to avoid excessive grades. These roads should form the skeleton of our future street system. In many cases it will be necessary to straighten them, and in all cases to widen them, but wherever possible the new lines should be parallel with the old ones, so that the old roads may become a part of the new street with as little disturbance as possible and without sacrificing the trees. What width shall we give to these old roads which are to become the principal arteries of our city? In the writer's judgment they should in most cases be not less than one hundred feet in width, and in some instances even wider. It is unnecessary for us at this time to determine the subdivision of the streets which are to exceed one hundred feet in width, but if the old road was fortunate enough to have good shade trees, the original highway can probably be preserved for pleasure driving, while another section can be reserved for railroad tracks, and, perhaps, still another for automobiles, with adequate sidewalk spaces. Such an arrangement for the separation of different kinds of traffic will require a total width of about 150 feet or even more.

These old roads which we are making the basis of our city plan may have been nearly parallel with each other or they may have been approximately radial, while the cross connections may have been infrequent or unimproved; but these cross connections will be a necessary feature of the final city plan which we have in view. They must therefore be carefully considered. They should be straight between the parallel or radial highways wherever possible and should join them at points where there are deflections. At these intersections there can well be an enlargement of the street area, creating plazas or spaces which will be available for a fountain, a monument, or some other decorative feature.

As soon as this system can be determined, the property required for the new streets, which we might, perhaps, call boulevards, should be acquired. The cost of this acquisition could properly be assessed upon the entire territory which will be developed by it, as the benefit will not be merely local, but their establishment will be the first step toward the development of the entire suburban area. If the whole system of arterial streets could be acquired under a single condemnation proceeding, it would be most advantageous.

When these controlling streets shall have been definitely determined, we need not worry about the details of filling in the spaces between them. Our city plan is fairly safe. Whether it would be advantageous to have the intervening spaces treated in a uniform or conventional manner is questionable. It is doubtful whether a regular plan is even desirable. Is Washington more beautiful than Paris simply because its great system of boulevards is superimposed upon a rectangular street system? To one who is studying the city merely as a plan this might seem desirable, but the interest of the average citizen is not in the map; it is in the street system itself, and it might be preferable to allow these various subdivisions to develop along lines of least resistance, without exercising too much control over them. In fact, if the treatment of these different sections varies, a more pleasing result may be attained. Here, where the topography suggests it, a serpentine system of streets may be laid out; there, a generous depth of lots, with space for gardens and ornamental planting, may be provided; here, again, we may find a group of narrower streets compactly built up with secluded courts and with small houses fronting upon a little plot of grass or shrubbery. Agreeable surprises may await us in strolling through these various sections, while a short walk in any direction will bring us to one of the system of thoroughfares where the traffic, the business and the amusements of the great city will be found. If one of these sections takes on a distinctive character, the neighboring districts will be stimulated to try and establish a character of their own.

If we attempt to establish a uniform cut-and-dried standard for all parts of a great city, it is more than likely that we will

find that we have "leveled downward." In all large cities the individual is likely to be lost, the neighborhood feeling is unable to survive. It is frequently held that this neighborhood feeling is an evidence of provincialism, that it is inconsistent with the development of a great city and belongs only to the small town. This may be true if we leave the city as a whole to develop as an unrelated group of neighborhoods, for a comprehensive plan cannot be evolved by a town meeting, a civic association or a group of them. The creation of such a plan needs a strong hand and a central authority which will be in large degree regardless of unimportant local interests. But, the general scheme once established by a system of thoroughfares such as has been outlined, the writer believes that a great degree of latitude should be allowed the neighborhoods and the individual developers, so long as the street lines and grades they wish to establish are not inconsistent with public convenience, with an abundance of light and air, with a rational and economical drainage system, and with good sanitary conditions.

No reference has yet been made to a system of parks and playgrounds, and the place which such a system should have in the city plan. This omission was intentional, as the writer does not believe that a park system should be a mere incident in the plan of a city. The policy of most of our cities, and with few exceptions this policy is especially notable in New York, has been to defer the selection of park sites until the necessity for park areas has become apparent, or until the public demand for them has become so strong that it cannot be ignored. Meanwhile, the entire city plan is likely to have been covered by a system of streets, many of which must be obliterated when the parks are finally laid out. It is scarcely necessary to say that the adoption of a street plan has resulted in the conversion of acreage property into city lots with a great increase in value. This value may be to a large extent speculative rather than real, but it is a value which will be reflected in the amount which the City must pay in the acquisition of the property.

It must be admitted that parks are a necessary part of any city plan, and that, therefore, they should be given a conspicuous place in designing a city street system. The writer, however, is disposed to go somewhat further and to maintain that instead of adapting the park system to the street system, the former should to a considerable extent control the latter. In other words, one of the first subjects which should receive serious consideration in the preliminary study of a city plan is that of available park sites. If there is a particular bit of woodland, an elevation with a commanding outlook, or even a piece of low-lying land traversed by a stream, which have not yet been cut up into building lots, they can be most advantageously set aside at this time as future parks. These reservations should be scattered over the entire area so that there will ultimately be some open space within convenient walking distance of every resident of the city. These parks should be connected by adequate roadways, not necessarily straight or even of uniform width, but contracted where the topography would involve expensive construction and again expanded to include a small area which might ultimately become a most attractive feature of our park and parkway system. As we are dealing with a territory which is at the present time suburban and where detached houses are likely to be always a characteristic feature, it will not be necessary to provide large park areas, and yet parks of considerable size may be exceedingly desirable as playgrounds and places of recreation for those living in the more congested areas in the older parts of the city, especially if they are so located as to be easily reached by existing or prospective transportation lines. It may be deemed unwise, or even foolish, to assume that parks will be ultimately needed in the particular localities which we have selected. The city may not grow in the direction and along the lines which we have assumed, but, while it must be admitted that the manner in which any city will develop and expand cannot be predicted with any degree of accuracy, it is not unlikely

that this expansion will follow the lines of least resistance, and if encouragement is given by a judicious selection of park areas connected by adequate roadways, and if the controlling features of our street system are laid out along the lines already indicated, the future development is almost certain to follow these lines, and the result will be a city plan which will appear logical and reasonable, rather than a mere accident.

In a territory such as we have been considering it may be useless to speak of the grouping of public buildings, for the important municipal centers will have already been established and will not be moved. There are, however, minor public buildings, such as schools, libraries, public baths and comfort stations, police stations and fire houses, for which provision must be made, and it would be most desirable to set aside here and there what might be termed "municipal blocks," upon which buildings of this kind could be grouped in a very effective manner. Our park areas and our "municipal blocks" should be acquired at as early a date as possible. It is often very difficult to justify a public expenditure in advance of actual needs when so many demands are being made for urgent municipal improvements in the older portions of the city, but a little foresight in this respect would undoubtedly save many times the sums which will inevitably be required to correct mistakes owing to lack of foresight in making provision for what is sure to be required some day. The writer knows of no instance of the formulation and execution of a policy such as has been outlined, but it appears to be so reasonable and logical that it is a matter of surprise that the problem of making a city plan has never been undertaken in this manner.

It is not submitted as a rule to be followed in city planning, but as a suggestion which may be thought worthy of serious consideration and discussion, in the hope that it may be of some slight assistance to those who are confronted with a problem of this nature.

BOSTON PARK NOTES

THE report for 1909 of the Metropolitan Park Commissioners (Boston, Mass., and neighboring towns), shows a most careful attention to the maintenance of the Metropolitan park system. Among some of the details are an incinerator for the disposal of garbage and picnic refuse at Revere Beach, which has reduced the cost of disposing of this matter. A police signal system has now been carried through a large portion of the parkways. At one point in what is known as the Speedway section of the Charles River division a show ring has been constructed and was used last year for two horse shows and for a series of races under the auspices of the Metropolitan Driving Club. Work was begun last year on a half mile circular track around the show ring for racing. A portion of one parkway was kept in condition during the winter for speeding on the snow and a pond was kept cleaned of snow and the ice scraped for skating.

The treatment of roads in the parks and parkways has claimed much of the attention of the superintendents. One of the rules of the Board prohibits the use of the roadways by automobiles having chains on the wheels. Considerable pressure has been brought to bear to have this rule repealed and the Board has met the difficulty by presenting the matter to the Legislature for solution, with the statement that if the rule is repealed it will be necessary to increase the Board's appropriation by \$14,000 to cover the repairs of the additional damage which will be done to the road.

Heavy asphaltic oils at the rate of about 1¼ gallons per square yard were used on gravel surfaced and some macadam roads, and refined tars and residual asphalts upon most of the macadam roads. Calcium chloride solution was used on some of the roadways which were not subject to heavy automobile traffic or where crossed frequently by pedestrians.

In the new construction a wearing surface of gravel two to three inches thick and thoroughly saturated with heavy asphaltic oil was used on a four-inch crushed stone base.

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A. PRESCOTT FOLWELL, Editor
J. H. DONNELLY, F. E. PUFFER, Assistant Editors

Business Department
S. W. HUME, President
J. T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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Passaic River Sewerage

FROM time to time we have given information concerning the slow but steady progress which has been made toward the final solution of the problem of disposing of the sewage which is now discharged into the Passaic River and rendering it one of the worst polluted streams in the country. On May 2 the representatives of the Passaic Valley Commission and the State of New Jersey came to an agreement with the Department of Justice, at Washington, as to just what disposal of the Passaic sewage would be satisfactory to the U. S. Government. According to this agreement the sewage will be passed through coarse screens to remove large floating matter, through grit basins where the finer and heavier matters may be deposited, then through self-cleaning screens of fine mesh, and, finally through extensive sedimentation basins. The clarified liquid will then be pumped through a tunnel to a point near Robins Reef Light, where it will be discharged through a series of outlets 40 feet below the surface at mean low tide. In addition to an agreement as to this general method of disposal, the State guarantees the absence in New York Bay of any visible

suspended particles upon the surface; of deposits causing a silting up of the channels objectionable to the Secretary of War; an absence in New York Bay and its vicinity of odors due to the putrefaction of organic sewage matters, or any grease or color upon the waters of the harbor arising from the sewage; of injurious effects upon the quarantine stations or other property of the United States about the harbor, and of reduction in the dissolved oxygen contents of the waters of the harbor to such an extent as would interfere with fish life; also the absence of any public or private nuisance. The army engineers are to have the decision as to whether these provisions are being carried out.

Unless other legal obstructions are raised by citizens of New York, this would seem to affirm the rights of New Jersey cities to dispose of their sewage in New York Bay by dilution; or possibly it should be called modified dilution, in that a large part of the suspended matter is removed from the sewage before being discharged into the bay. What disposition is to be made of the matter so removed apparently forms no part of this agreement, nor we believe have any definite plans therefor been decided upon.

On another page will be found an argument in favor of disposing of the sewage of large cities in the Great Lakes or other large bodies of water, special reference being had to the city of Rochester and Lake Ontario. The theories and reasoning advanced by Mr. Kuichling in the report from which this was abstracted would apply with equal force to a considerable number of cases. These two recent instances are indications of a change in the attitude of engineers toward the disposal of sewage by dilution. While the sewage of more cities is discharged in its crude state into streams or other bodies of water than is purified in any way, and while this method of disposal has been in use longer than any other, much less is known of the theory and the best practical methods of disposing of sewage without creating a nuisance and so as to produce final oxidation in this way, than by almost any other method of disposal. Recently, however, attention has been directed to the so-called "self-purification of streams" by investigators in Germany, England and United States, and indications are that the next few years will see great and important additions to the knowledge of the processes and agencies involved in the destruction of sewage matter by dilution.

Uniformity in Fire Hydrants

ONE of the late reports of the National Board of Fire Underwriters on the water supply system of a southern city relates a condition of affairs with reference to fire hydrants which is certainly open to criticism. Some of the hydrants in this city open to the right, others to the left. About 3 per cent have gates on the connections to the main. Post and cap nuts are of various sizes and forms, in consequence of which pipe wrenches are required for operating the hydrants. A number are outside the curb line and others are in equally unsafe places. A wide range was found in the thread diameter on the hydrant outlets, and the number of threads per inch on the same size outlets varied on different hydrants.

A fire hydrant is intended primarily and should be used exclusively for fire service. Such use is demanded on an instant's notice, and the opening of the hydrant is frequently done by a man who is too hurried to look up a book telling whether this particular hydrant opens right or left-handed and whether the fire hose coupling will fit the nozzle or whether an adjusting coupling is required. The result is apt to be delay in getting water on the fire with consequent loss of property, and possibly a broken valve stem from too much muscle applied in endeavoring to open by turning in the wrong direction. Our advice to a town where these conditions exist would be to decide upon a uniform direction of opening, form of nut and thread of nozzle and then change all hydrants at once to conform to these standards. This would be expensive, but probably not more so than the loss which might be occasioned at one fire because of present conditions.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Police and Fire Items—Government and Finance

ROADS AND PAVEMENTS

Paving Hindered by Scarcity of Granite Blocks

Cincinnati, O.—A scarcity of labor at Lithonia, Ga., quarries threatens to make a general change in the Cincinnati specifications for granite block paving. The contractors have already asked Service Director J. H. Sundmaker for permission to use other materials than those specified in their bids. Thomas P. Strack, who has the Carthage avenue job, and John Funke & Co., who have the Harrison avenue job, both advised the Director that they are unable to obtain sufficient Lithonia granite to carry out their agreement with the city. Funke was granted permission to use granite from Mount Airy, N. C., and Strack was instructed to advise the Service Department what other granite he expected to use. The Kirchner Construction Company has agreed to pave Spring Grove avenue with granite blocks from the Pine Mountain Granite Company, but he now asks that he be allowed to use some Lithonia granite, the same material which other contractors claim they cannot get. The permission was granted. Sundmaker states that after investigating the matter he has learned that the labor supply, especially of stone cutters, is short in the quarries. He states also that the contractors have been advised that they must supply blocks from quarries which have met the Government requirements and that he has furnished the contractors with a list of such quarries.

Solution for Sidewalk Obstructions

Cleveland, O.—Councilman Fleming believes that he has found the ideal way of dealing with the sidewalk regulation question, and has introduced in Council as a substitute for the ordinance passed several weeks ago a new measure, which combines the best features of similar measures in other cities dealing with the question. Section 1 of the new ordinance provides that no person, firm or corporation shall obstruct the sidewalks in any way, while the following section contains the exceptions. Section 2 provides that the ordinance shall not be construed to prohibit merchants and other business persons from using and occupying for a width of three feet of the inside space. The ordinance also stipulates that none of the provisions shall apply to the market districts.

Sidewalks Transform Appearance of Town

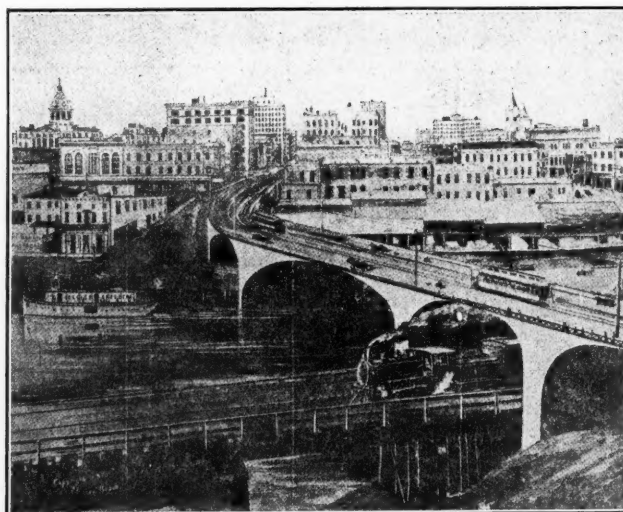
Columbia, Tenn.—Visitors to Columbia are all surprised at the large number of freshly laid concrete walks and the extensive preparations for laying many more. During the past two years the city has been transformed from a badly paved town to a splendidly paved one. Worn brick paving has been replaced with smooth concrete. Many miles of walk have been laid by the city and by private contract. It is claimed that Columbia is now better paved than almost any other town of its size in the South.

Chert and Asphalt Road

Gadsden, Ala.—An ordinance has been passed for treating Forest avenue with an asphalt preparation that is guaranteed to lay the dust and keep the street dustless for the space of one year. Petitions were presented for several other streets to receive similar treatment, but these were referred to the street committee and will be acted upon as soon as a report thereon is had. The cost of treating the street with the patent preparation is said to be much less than it would cost to keep the street sprinkled with water. If the preparation proves effective it is probable that most of the residence portion of the city will have its streets improved in this manner. In making the improvement the street is first cherted and rolled, and then treated with the asphalt. Putting the street in condition is done by the city, but the expense of the asphalt is borne by the property holders abutting the improvement.

Viaduct Over Ship Channel

Houston, Tex.—The United States Engineers have decided that a viaduct over the ship channel will not violate navigation regulations. The plans submitted to the Government Engineers provide for a structure of the following character: Length over all, 1,600 feet; width, a trifle over 62 feet; clearance over high tide, 55.6 feet; structural work,



Courtesy Houston Chronicle.

VIEW FROM NORTH SIDE OF SHIP CHANNEL, LOOKING TOWARD BUSINESS DISTRICT OF HOUSTON, TEX.

steel; footments, reinforced concrete; type, suspension; abutments, reinforced concrete; cost, slightly in excess of \$225,000. The abutment on the south end of the bridge at the foot of Main street as proposed will be about 100 feet long before the approach to the first span is reached. The traffic surface of the bridge is divided into six sections, each independent of the other, and include two tracks for street car service, two wagon tracks and two walks, the walks to be on the outer extremity of the bridge. There can be no interference in the traffic, everything being doubled. The entire structure, if built, will contain about 3,000,000 pounds of steel when completed.

Public Work in Commerce

Commerce, Tex.—One mile of concrete sidewalk was laid in Commerce last week and about five miles were contracted for. Sidewalks are not the only kind of public work in sight for Commerce, surveys having already been completed by City Engineer T. W. Smith for a sewerage system.

Mexican City to Begin Paving

Chihuahua, Mexico.—The Compania Bancarie de Fomento Bienes Raices, S. A., of the City of Mexico, which has contracts to put in nearly 700,000 pesos worth of public improvements in this city, including 20,000 square meters of asphalt pavements on the principal streets in the business portion of the city, has its machinery and appliances for the pavement work here, and Mayor José Asunsolo says the paving will be commenced between May 15 and June 1 and rushed through to completion as rapidly as possible.

Street Accidents in New York

New York, N. Y.—In April all records for fatalities in streets in which children were victims were broken. The report of the National Highway Protective Society on accidents caused by vehicular traffic shows that in New York City 18 persons were killed and 62 injured. Trolley cars caused five deaths, automobiles nine, wagons three and runaway horses one. Of those killed 13 were under 16 years of age. Of the injured 16 were children who were hurt seriously.

Want Better Street Plan

Lowell, Mass.—A movement has been started by the Board of Trade to look into the matter of improved and proper methods of laying out the streets of the city, and at a recent meeting of the directors of the Board it was voted to appoint a special committee to take the matter in hand. President Harvey B. Greene announces the appointment of the following committee: Robert F. Marden, chairman; J. Harry Boardman, City Engineer George Bowers, Alderman Arnold Byam and Herford N. Elliott. The committee has been instructed to investigate the matter and report back to the committee. Recently the Board was addressed by an expert on such matters, whose contention that curved and crooked streets have their economic value, and with this new information as a nucleus the Board has decided to tackle the rather large problem. The Board is satisfied that the best interests of the city require some attention to the matter of street building, and hence its present movement. Once the committee gets under way the assistance of experts on city building will be obtained to show what might be done with Lowell streets in the future, looking toward more than one direct route of ingress and egress so far as outside traffic or through traffic of the city are concerned. A plan may be drawn up for consideration whereby the new street lines may be made to deviate from the gridiron plan sufficiently to provide suitable routes around and across the new sections and also to hit off with the termini of the older streets of the vicinity.

Renaming Streets and Renumbering Houses

Portland, Ore.—An ordinance for renaming the streets and renumbering the houses of the city is to be adopted by Council. The plan, as laid out by City Engineer Morris, divides the city into four districts, to be known as Northeast, Northwest, Southeast and Southwest Portland. The dividing lines will be Burnside street, running east and west, which will be known as Central avenue, and East Water street, running north and south, to be known as Division street. All streets running east and west and parallel with Burnside street will become avenues and all running north and south and parallel with East Water street will become streets. The thoroughfares will be numbered in each direction from the two main division streets, and there will be 100 numbers to each block. There will be several slight modifications which will remove many objections which have arisen.

Railways and City Disagree on Paving

Los Angeles, Cal.—The street railways are to be prevented from paving along their tracks until the City Council defines the city's policy on the question of paving specifications. The Board of Public Works is in a dispute with the street car companies because they follow their own specifications and ignore those of the city, although the law and franchises require them to conform to the city specifications. The city requires a base of five inches of cement-concrete with a three-inch asphalt surface. The companies have been laying six inches of asphalt-concrete.

State's Millions in Jersey Roads

Trenton, N. J.—Figures in the office of State Road Commissioner Gilkyson show that New Jersey has spent \$2,859,735 in the building of improved roads since 1892, when the State Aid Road law went into force. This amount represents only one-third of the total cost of the roads. The number of miles built is 1,477. The year's record was 1902, when 154 miles were constructed.

Cannot Restrict County Employment

Trenton, N. J.—The attempt of the Mercer County Freeholders to permit none except legal voters of Mercer County to obtain employment on the improved roads of the county has been frustrated by State Road Commissioner Gilkyson, acting on the advice of Attorney-General Wilson. Recently the Freeholders decided that they would employ none but Mercer County voters on the roads of the county, and they inserted a clause in road specifications to require all contractors to employ only such. Road Commissioner Gilkyson took the matter up and asked the advice of the Attorney-General, by whom he was informed that such a restriction could not legally be incorporated in the specifications.

SEWERAGE AND SANITATION**Police to Arrest Spitters**

Columbus, Ind.—In accordance with an order issued by the City Board of Health, Mayor Barnaby has instructed all of the city police to rigidly enforce the anti-spitting ordinance, an ordinance which was passed several years ago, but which has never been enforced. The ordinance prohibits spitting on sidewalks or in any public place and provides a fine of from \$1 to \$10 for each violation.

Board of Health Will Issue Bulletin

Macon, Ga.—The Board of Health will publish a monthly bulletin, which will contain vital statistics and articles on health and the prevention of disease.

To Flush Polluted Creek

Muskogee, Okla.—Giving the results of his investigation of the condition on Coody's Creek, where the sewers empty, Engineer Clonts has submitted a report that shows the conditions there to be bad. He suggests that some steps be taken soon to permanently care for the sewage. Referring to the proposed plan of flushing the creek, the engineer says that by building a 3½-foot dam a reservoir can be had that will hold 2,500,000 gallons of water. This furnished by the city to flush the creek twenty times, which he estimates would be necessary in the summer, would mean a cost of from \$4,000 to \$6,000.

Passaic Valley Sewer Litigation Ended

Newark, N. J.—United States Attorney-General Wickersham has signed the contract with the Passaic Valley Sewerage Commissioners by which the Government withdraws its opposition to the construction of the sewer and the State Commission agrees to purify the sewerage by screening and sedimentation before discharging it into New York Harbor. The action of the Government was brought late in 1908. The Passaic Valley sewage district was created in 1902, but agreements on the part of the municipalities to join in the construction of the sewer were not made until 1907 and later. The results reached are expected to have a direct and important bearing upon a similar controversy between the United States and New York State in reference to the Bronx Valley sewer, now under construction.

Ordinance to Rid City of Flies

Omaha, Neb.—Health Commissioner Connell is urging the passage of an ordinance to compel the placing of manure either in flyproof containers below ground or in boxes above ground that shall be covered with screens that flies cannot get through.

Opposition to Cement Pipe for Sewers

Portland, Ore.—Mayor Simon, City Engineer Morris and Councilman Ellis are going to have a hard fight on their hands over their efforts to introduce cement sewer pipe in the city. Much opposition to the proposal has arisen on the ground that cement pipe will prove a failure. Others, however, declare they have thoroughly investigated and find cement as good as vitrified clay pipe, if not better. They also declare that one company has control of all the clay pipe used in this city and is maintaining too high prices, and are of the opinion that if there is competition the cost of sewers will be greatly decreased and the property owners will receive the benefits. Recently Deputy City Engineer Cobb, in charge of sewer construction, resigned because he did not agree with City Engineer Morris on the matter. Plumbing Inspector William Hey and City Health Officer Wheeler have placed themselves on record against the use of cement sewer pipe. Hey has refused to permit certain property owners to lay it on their premises for the drainage of waste water, and has declared that he will continue to do so until an ordinance is passed which will force him to permit its use.

Map of Sewer System

Roseville, Cal.—City Engineer Marshall has completed a small map of the city for the Board of Trustees, showing the location of each of the sewer mains and laterals. This map was signed by the Board members and a cut will be made and several thousand copies circulated about town, so that every voter can see just where the mains will come in connection with his property.

WATER SUPPLY

Will Use Copper Sulphate in Reservoirs

Baltimore, Md.—Relief from the intolerable condition of the drinking water of the city is promised by Water Engineer A. M. Quick in a few days. Work is being done on four of the city reservoirs, and it would not surprise Mr. Quick if the copper sulphate which is being deposited in the lakes will begin to remedy things. The treatment, which consists of applying a pound of copper sulphate to every 1,000,000 gallons of water, will be applied to Lakes Clifton, Montibello and Guilford and the high service reservoir in Druid Hill Park. Gunnysacks will be filled with copper sulphate and dragged behind boats, which will move in concentric circles.

Buffalo Intake Tunnel Holed Through.

Buffalo, N. Y.—On the first of May, at 8 a. m., a blast was set off that shattered several feet of rock and connected two sections of the 6,600 feet of new tunnel from the pumping station at the foot of Porter avenue to the new intake pier out in Lake Erie. The last barrier of rock separating the sections of the tunnel was a few hundred feet from the intake pier. When the intake was placed in position a year ago a part of the tunnel was drilled in toward the pumping station. Then work was started at the other end. Nearly all of the work was done under an air pressure of about 25 pounds, as the limestone rock has many seams. C. H. Hollingsworth, superintendent of the Buffalo Dredging Company, says there is still three or four months work ahead. About 600 feet are still to be lined with concrete and the lower half of about 400 feet will have to be blasted out. The tunnel is 12 ft. wide by 11 ft. 3 in. high inside the concrete lining.

El Paso and Water Company Near Agreement

El Paso, Tex.—Federal Judge Maxey has refused to take the responsibility for fixing a rate for water by the International Water Company or deciding the minimum rate matter in reference to tenements, but referred them to the city. Master in Chancery J. D. Sayers, ex-Governor of Texas, recommends the new rates, after lengthy conferences with water officials and city officials, and Judge Maxey referred it all to the City Council. The Council and the water officials agreed at once on all but one clause in a new franchise; that clause regulates the amount which the company can earn and the company objects, officials believing it too small. The new minimum charge for water will be \$1.25 a month, instead of 90 cents, the old rate, provided the city and water company reach agreement on one other point. The new charge per thousand will be 35 cents instead of 20 cents, the old rate, provided the company accepts the terms the city seeks to impose. The International Water Company will at once put in over \$400,000 worth of work and agree to furnish the city with an ample supply of pure mesa water. The city will regulate and decide the matter of minimum charges in tenement houses.

New Move to Buy Boonton Works

Jersey City, N. J.—The city officials are about to resume the deliberations regarding a settlement of the water question, and this time the conferences may include the terms on which Jersey City is to assume control by purchase of the new water works at Boonton. Some litigation still in court needs to be closed up before the purchase can be effected; but the Street and Water Board is ready now to push the final negotiations looking to the taking over of the works. Mayor Otto H. Wittpenn and the Board of Finance will have a voice in these deliberations.

Difficult Pipe Laying

Tacoma, Wash.—A difficult job of water pipe laying will be involved in the construction of water mains to the flatlands where the lumber yards are situated. A 16-inch main will be laid across the city waterway and two 12-inch mains on the bed of the Puyallup River. At the city waterway the current is slight, but the depth of water is about fifteen feet. In the Puyallup River the depth of water is inconsiderable, but the current is four feet a second. The mains will rest on piles and be protected by piles extending above the pipe on the upstream side of the river.

Water Meters Will Be Used in Fulton

Fulton, N. Y.—At a meeting of the Board of Public Works it was decided to buy sufficient meters to equip every tap in the city. Commissioner of Works N. L. Whitaker states that the expense will be defrayed by the city and not by the consumers. The scarcity of water in the springs has alarmed the board to such a degree that it was decided that some measures must be adopted at once to preserve the water supply. After a thorough investigation it was determined that the meters would save a very large quantity of water daily, enough, in fact, to have a large supply on hand all the while.

Park and Advertising at City's Standpipe

Lockport, N. Y.—Superintendent of Water Works Peterson has put a gang of men at work painting the standpipe at Summit and South Transit streets. Big, white letters, advertising Lockport's Old Home Week will also be painted on the black background to greet incoming autoists along the Transit. Superintendent Peterson also has men at work around the standpipe grading, etc., preparatory to making a nice park lawn around the place. Flower beds and earthenware flower pots will be set out. There is a strip of 75 feet around the pipe which the city owns.

Officials Will Press Claim to Hetch Hetchy

San Francisco, Cal.—Mayor P. H. McCarthy, City Attorney P. V. Long, City Engineer Marsden, Special Counsel E. A. Lane and Professor Charles D. Marix of the college of engineering of Stanford University will represent the city of San Francisco at the hearing of the Hetch Hetchy Valley water grant matter before Secretary of the Interior Ballinger in Washington, May 18. They will press the municipality's claim to the Government land under the Garfield grant, which was ordered held in abeyance until such time as officials of this city could show cause why it should not be permanently revoked.

Purer Water for Utica

Utica, N. Y.—President Sherman, of the Consolidated Water Company, gave out a statement which was in part as follows: "Plans are already partially completed and by midsummer we will have installed two sterilization plants, one for the northern water supply and one for the southern water supply. This step has been under advisement for some time and after careful investigation by the Commissioner of Public Safety and Health Officer it meets with their hearty approval."

STREET LIGHTING AND POWER

Discuss Lighting Problem with Company

Kansas City, Kan.—Negotiations for the purchase of the plant of the Consolidated Electric Light and Power Company by the city were opened when John M. Egan, president of the light company, met the City Commissioners. The Commissioners laid the matter before Mr. Egan and explained the situation in regard to the shortage in the lighting fund. Mr. Egan showed a desire to aid the Commissioners in solving the problem. He instructed A. L. Berger, attorney for the company, to confer with R. J. Higgins, City Counselor, with a view to finding some way by which the street lights can be continued until the company can provide the Commissioners with a statement of the exact cost of lighting Kansas City, Kan. He did not say that the company would place a price on its plant, but promised to give the Commissioners the benefit of its records in ascertaining the cost of lighting the city.

Poles and Wires Off Paterson Streets

Paterson, N. J.—An ordinance passed by the Board of Works orders the unsightly telegraph and electric service poles and wires in the center of the city to be torn down not later than June, 1911. The people of Paterson have been agitating the removal of these wires and poles for some years. All overhead wires, with the poles carrying them, except trolley poles and the poles for arc lights, must be removed from the district bounded by the Passaic River, Spruce street, Grand street, Essex street, Straight street and the river. A penalty of \$50 a day is imposed for violations.

Proposes to Build Electric Lighting Plant

Haverhill, Mass.—Charles H. Henrich, New England representative of the gas engine department of the National Meter Company, has made a proposition to build an electric plant for Haverhill under certain guaranties as to cost of plant and operation. The power would be supplied by a 250-horsepower Nash producer gas engine. The figures are as follows:

Coal, 410 tons at \$5 a ton, giving a total of 547,500 K. W. hours at 10 hours per night.....	\$2,050.00
Oil and Waste.....	200.00
Labor for two men.....	2,000.00
Horse and team.....	800.00
Supplies.....	375.00
Water, 547,500 cubic feet at 2c per hundred.....	1,095.00
	\$6,520.00
Fixed Expenses.	
Interest on \$24,420 at 5 per cent.....	\$1,221.00
Depreciation on \$24,420 at 5 per cent.....	1,221.00
Repairs on \$24,420 at 2 per cent.....	488.40
Fire Insurance.....	50.00
	\$2,980.00
Total of operating and fixed expenses.....	\$9,500.00
Add 10 per cent for contingencies.....	950.00
	\$10,450.00
For 300 lamps of 500 watts each single plant \$34.83 per lamp per year.	

Report of Council Bluffs Electrician

Council Bluffs, Ia.—The report of City Electrician Ed McKinley showed that monthly tests of arc lamps used for street lighting showed during the year an average voltage of 71.6. The ordinance governing street lighting requires 70 volts. Expenditures of the department during the year aggregated \$2,344.11, of which \$1,961.55 was for salaries, and the balance for supplies and sundries.

Light Plant Shows Good Profit

North Birmingham, Ala.—The following statement of the officers of the electric plant for the first three months of the year was made by Alderman Simon Klotz to the Board of Aldermen:

Revenue	
Receipts from charges for light.....	\$2,517.44
Forty-nine street arcs at same rate Birmingham is paying Birmingham Railway, Light and Power Company	918.75
Uncollected light charges at end of quarter.....	1,240.54
Total	\$4,676.73
Expense	
Salaries and wages.....	\$ 789.36
Fuel	1,302.67
Other Supplies	113.00
Repairs	137.48
Refunds	4.08
Office expense	173.63
	2,521.67
Gross profit	\$2,155.06

"If the interest on the entire bonded indebtedness (which amounts to \$625 for the three months) were deducted, together with a fair depreciation of the actual value of the plant, a handsome profit would still be apparent," concluded the report, which is signed by C. S. Petersen, City Auditor, and V. R. Emrick, Superintendent of Plant.

Electric Meter Tests Provided for District

Washington, D. C.—Testing of electric light and power meters is again made the subject of a bill in Congress, and the Commissioners have forwarded to Representative Samuel Smith, chairman of the House District Committee, a brief report giving their approval of the measure. The bill provides for an inspection of electric meters by the District's electrical department, in much the same manner as the gas meters are inspected by the gas inspector. The Commissioners will be authorized to prescribe "reasonable fees" for the inspection of a meter, but should it be found that the consumer is suffering to the extent of 3 per cent above the correct measure, the company furnishing the current will be charged with the inspection. After the passage of the bill no meter can be installed without the District's official seal. Consumers must apply in writing for an inspection, as there is no provision for a regular canvass of meters. The bill provides that the cost of fitting up a laboratory for the examination of test meters shall be paid by each corporation, firm or individual furnishing the current, in proportion to the sale of current by each concern. The bill also provides that the Potomac Electric Company shall deposit \$7,000 with the District to cover the cost of fitting up the test laboratory and of maintaining it for a year.

FIRE AND POLICE

Autos May Replace Horse-Drawn Vehicles

Beverly, Mass.—At a recent fire in Beverly there was only one man in the central fire station where two steamers and a hose wagon are in quarters. Fire Department horses work on sprinkling carts. Mayor Charles H. Trout is considering the feasibility of having auto apparatus, dispensing entirely with horses.

Pension for Buffalo Policemen.

Buffalo, N. Y.—Mayor Louis P. Fuhrmann, after a public hearing at which no opposition was expressed, signed the police pension bill, known as the commission bill. This is the measure which was opposed by the Councilmen. Its principal provisions are the contribution of 2 per cent of the salaries paid to police officers and the retirement, on application and without disability, at the end of twenty-five years' service in the department. The present pension fund has been in danger for some time. The drafts upon it last year amounted to \$67,379, while its income was only \$44,478, at which rate it would soon have been wiped out. The voluntary contribution of 2 per cent of their salaries by members of the department will produce about \$16,000 a year.

New Fire and Police Systems

Butler, Pa.—Representatives of the Dean Electric Co., of Elyria, O., were in the city last week in the interests of the proposed fire alarm system that has been talked of in Butler for nearly a score of years. The Dean company had a combination fire alarm and police box on exhibition at the office of the People's Telephone Company, where it was inspected by members of the Fire Committee and other members of the City Council. In the combination box the strong feature is the police call box. In this box are three flash lights which can be seen for a considerable distance. They are operated from the central station and should central have occasion to call a policeman on a distant beat the flashlight is turned on and could be seen for a number of squares. The light will remain until the officer answers the call. The fire alarm is about the same as that used by the Gamewell Company, there being a separate compartment in the box for the Fire Department. To turn in an alarm of fire a glass in the side of the box is broken, the key of the box being under the glass. Then by pulling a hook, the alarm goes to the firemen—and they do the rest.

Competitive Revolver Matches for Police

Camp Perry, O.—Revolver matches for the police of the country will be a new and interesting feature of the national shoot at Camp Perry, August 8 to 25. The National Police Team Match will be shot for the first time on August 11. Each team is to consist of five policemen from the force of a single city. At 15 yards each man will fire two scores of five shots each, rapid fire, 8 seconds to each score. At 25 yards each man will fire two strings of five shots each, timed fire, 15 seconds to each score, and at 50 yards each man will fire five shots, slow fire, 20 seconds for each shot. A calibre of revolver from .32 to .45, and having a length of barrel not less than 4 nor more than 6 inches may be used. The National Police Individual Match will run from August 9 to August 12, inclusive, and will be open to any police officer in the United States furnishing a certificate that he has been on the police force of his city, town or village for at least three months prior to the match. The ranges and times of firing will be the same in this match as in the National Police Team Match. The regulations as to the weapons are also the same for both matches. For the National Police Team Match the Colt Company has given a handsome sterling silver trophy about 14 inches high with a base of about 16 inches and having three handles of novel design. The trophy is mounted on a burnished copper base which makes a very attractive combination. The match will be an annual event, and the trophy will remain in the custody of the police force winning it from year to year. In the individual match there will be a number of money prizes and medals.

Fire Alarm Boxes for Moving Picture Shows

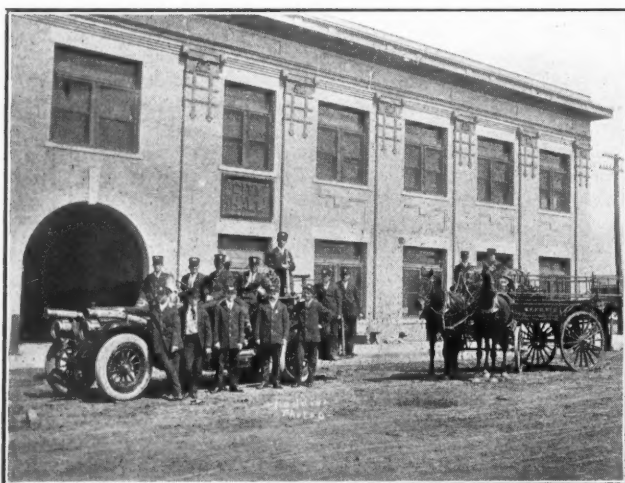
Detroit, Mich.—Moving picture theaters have been ordered to place fire alarm boxes in the building, and are complying with the rule.

Auto Apparatus and Underground Wires for Elizabeth

Elizabeth, N. J.—The substitution of auto chemical apparatus for hose wagons now in use is recommended by Fire Chief Gerstung, also the placing of all fire alarm wires in underground conduits, and the adoption of an ordinance regulating the sale and storage of explosives. Chief Gerstung reported that much difficulty had been experienced with the aerial wires during the past year, and during severe storms no less than three circuits had often been broken, leaving a wide area practically unprotected. He urges the erection of a new fire house in which a motor engine can be installed, and points out that the cost of maintaining a motor fire engine is less than the cost of feed, shoeing, veterinary service, repairs for harness, etc., for horses. In suggesting that in the future auto chemical engines replace the old horse-drawn hose carts, Chief Gerstung said this, too, would mean a saving to the department with increased efficiency, and said there is not an engine house in the city that could not accommodate without alterations an auto chemical wagon.

Wichita Falls Fire Department

Wichita Falls, Tex.—The volunteer Fire Department is said to own the largest fire auto in the State. It is a 98 horse-power, six-cylinder machine, and carries a pump which will throw 700 gallons per minute. The engine carries 1,000 feet of hose, one 40-gallon chemical tank, a hose



Courtesy Dallas Morning News

LARGEST FIRE AUTO IN TEXAS

reel, two extinguishers and two 10-foot ladders. The auto is named "Vic," in honor of Chief Stamphli. A new addition to the fire station for the engine is under construction, which is to be a two-story building, the second story to be used as a hall. Last year the department received \$600 donations from the public, \$100 from the city and \$100 from the Chamber of Commerce.

Criticism of New Auto Chemical

Wilkes-Barre, Pa.—Considerable fault is being found with the new auto chemical recently purchased at a cost of \$4,500 for the city Fire Department. The machine is a handsome one from a mechanical standpoint, but it will not fill the bill as a firefighter, it is claimed by persons who are in a position to know. The old chemical wagon at No. 2 engine house had a tank with a capacity of 120 gallons and this was considered inadequate for fire purposes. The new auto has a tank with a capacity of but 35 gallons, and from the standpoint of old firemen it is far too small to be of material benefit to the city. The space allowed for the carrying of hose is short by two feet at least, some claim. This will mean injury to the hose. By placing it in short space there will be many kinks, and these only serve to decrease the value of the hose. When drivers and firemen attempted to remove the new auto from the station the first day the machinery refused to work and it required exactly 30 minutes to get it from the house. There are many who believe that the auto as now constructed does not fill the bill and the company may be forced to make many needed repairs in the machine before the cost price is turned over.

Tire of Fire Auto Bursts; Kills Three

Macon, Ga.—Three firemen were killed the morning of May 6 and three others were injured when the tire on an automobile engine exploded on the way to a fire. The dead are Lee Roberts, C. A. McCreary and J. E. Buffington. The engine was going at a terrific rate of speed when the accident occurred. The accident was caused by the puncturing of a tire which caused the machine to swerve to the right against the curb; it side-swiped two telegraph posts, 60 feet apart and collided with a third, breaking it off at a point six feet from the ground. Here the auto turned over. The machine was probably going at 30, and possibly 40, miles an hour.

Recommendations for Lessening Fire Hazard

New Bedford, Mass.—A committee of the Board of Trade has made the following recommendations for lessening the fire hazard:

Covering of roofs with fireproof materials; revising the building code; more efficient fire stops in the construction of wooden buildings; safe construction of chimneys; the appointment of a competent supervisor of wires; systematic inspection of alleys, back yards and storage places; making the fire department a permanent force as soon as possible; housing in fireproof quarters the headquarters apparatus of the fire alarm telegraph, and increasing the number of fire alarm boxes; the purchase of at least two first-class fire engines; arrangements with the local towboat company for the equipment of a towboat, to respond to alarms along the water front, if needed; arrangements for the services of officers and men from Fort Rodman, if the use of explosives is needed to check a conflagration; and more thorough enforcement of the State building laws.

GOVERNMENT AND FINANCE

Bureau of Municipal Research for Boston

Boston, Mass.—A Bureau of Municipal research is to be established in this city, but not under the direction of Mayor John F. Fitzgerald. It is to be an adjunct of the Finance Commission, and controlled wholly by that Board, which opposed Mayor Fitzgerald's plans for the establishment in this city of a branch of the New York Bureau of Municipal Research. The Finance Commission considered the City Council's request to establish a Bureau of Municipal Research and unanimously complied with it.

Engineer's Authority Increased.

Charleston, S. C.—An ordinance giving the City Engineer the right to regulate the salaries of his assistants has been ratified by the City Council.

Dividends Paid Instead of Taxes

Khigenburg, Germany.—In the town of Khigenburg, Germany, last year no rates were levied, and each inhabitant was given a dividend of £10 from the profits of a municipal brick works.

Mankato Votes for Commission

Mankato, Minn.—The commission form of city government was adopted in a special election by 298 majority, 969 votes being in favor and 671 against it. The joint commission charter was defeated last September by 28 votes, and the objectionable features were corrected for the second test. The liquor interests and the members of the City Council opposed the new charter. Mankato is the first city in Minnesota to adopt this form. It goes into effect May 26.

Single Heads for Departments

Roswell, N. M.—The plans of Roswell's new Mayor, Dr. G. T. Veal, are similar to those obtaining in cities having the commission form of government. He proposes to place under the control of one man the street and alley work, water works, sewers, garbage and street sprinkling, and has recommended J. W. Bennett, the present superintendent of the city water works. Mayor Veal also plans to name but one man on each of the other standing committees, with the possible exception of the committee on finance and perhaps the water, lights and sewer committee.

STREET CLEANING AND REFUSE DISPOSAL

Bronxville Has "White Wings"

Bronxville, N. Y.—Following the example of a number of other municipalities in Westchester County, Street Commissioner Utz has decided to "white wing" the men at work on its streets. Bronxville has always been noted for its progressiveness, and now the village will see working on its streets men donned in white.

Street Cleaning in Dallas

Dallas, Tex.—Twenty-six men are steadily employed in cleaning paved streets only. These cleaners use twelve carts and four trash wagons owned by the city and are run continuously during the year, cleaning alleys and removing trash in barrels. The sanitary night force consists of a foreman and six teams that sweep and clean the gutters. Four St. Louis flushers are used in the business district and twenty sprinklers are run with hired teams in the outlying sections. All equipment, stables, workshops and storehouses for this department, and plant used by mechanics for its repair, are owned by the city.

"Clean-Up Week" in Harrisburg

Harrisburg, Pa.—Last week was "clean-up week," and merchants and citizens generally complied with the proclamation of Mayor E. S. Meals in gathering up the debris, white-washing fences and sprinkling lime. The Civic Club and the Board of Health were behind the movement.

Garbage Rates May be Changed

Johnstown, Pa.—Johnstown citizens generally, and hotel and restaurant keepers in particular, are awaiting with some show of curiosity an announcement of a reduction in rates by the garbage collectors' organization following the decision of the Board of Health to burn garbage free of cost at the Seventh Ward disposal plant. The charge for decayed vegetable matter was \$1 a wagon load, and with this fee removed the collection of garbage could be made quite profitable, even with a reduction of rates by the scavengers. There is some talk of the organization of a large company for the collection of garbage—a company of sufficient capital to maintain enough teams to thoroughly cover the whole city—but no definite step in this direction has as yet been taken.

Discuss Using Trolley Cars in Garbage Work

Newark, N. J.—Informal consideration was given by the Board of Works to plans for utilizing the authority given at the last session of the Legislature to transport garbage and other refuse over the trolley lines of the Public Service Railway Company. The law empowers the Board to acquire stations where collections can be deposited and then transported to the place of final disposal by trolley car. It also authorizes the city to contract with the traction company for a period not exceeding five years for such transportation, which must be confined to the time between midnight and 6 o'clock in the morning. Before action can be taken an appropriation must be secured. The Chief Engineer was empowered to confer with the City Counsel and report back an estimate on the probable cost.

Summer Sanitary Rule

New York, N. Y.—With the approach of the summer season, and consequent open doors and windows, Police Commissioner Baker has called to the attention of the force the need of strictly enforcing Rule 45, Paragraphs 69 to 73, inclusive, which read as follows:

Patrolmen will be held responsible for the strict enforcement of the following provisions of laws and ordinances on their respective posts:

Ashes and garbage to be kept in separate receptacles. Said receptacles not to be filled within four inches of the top. Unauthorized persons to be prevented from interfering with said receptacles or the contents thereof.

Streets and sidewalks not to be encumbered by goods, merchandise, boxes, bales, etc., or unused vehicles.

Storekeepers, householders, etc., to be prevented from sweeping the dust from their premises onto the sidewalks unless same is swept into the gutter and there piled before 8 a. m.

Dirt, paper, etc., not to be thrown into the street.

Cost of Operating Crematory

Jacksonville, Fla.—Superintendent of Streets W. C. West has submitted a detailed and comprehensive report of the operations of the Street Cleaning Department for the month of March, 1910. The report stated that for the period mentioned the Department had handled 14,555,000 pounds of refuse matter, which had been delivered to the crematory, and 14,337,000 pounds taken to the various dumps. The total amount of garbage destroyed at the crematory amounted to 699,200 pounds. Cost of operating the crematory reached the sum of \$272.39; feed of prisoners, \$493.54; amount of collections for hides, sacks, etc., \$85.70.

New Street Flushing Device Put Into Use

Portland, Ore.—Another new street flushing device has been put in operation by the Street Cleaning Department. It consists of a long line of hose on wheels which is drawn along the pavement by one horse. The hose is attached to the fire hydrant and the nozzle is operated by two men. It is used on hard surface streets. As much work in cleaning streets can be done by this device and four men and one horse as with a full crew of power brooms. The water also carries every particle of dirt on the pavement into the sewer basins. Several of these devices will be installed and they will be used largely on streets of considerable grade, where it is difficult for the power brooms or wagon flushers to operate.

"White Wings" at Portland, Ore.

Portland, Ore.—A "White Wings" Brigade has been established by the Street Cleaning Department and the members have been putting the street in spic and span order. The police authorities have also been directed to insist on a strict observance of the ordinance against sweeping trash and office and store refuse onto the streets. Also to restrain the negligent citizen from strewing the streets with paper wrappings, fruit peelings, peanut shells and the like.

RAPID TRANSIT

Mayor on Speed Ordinances.

Auburn, N. Y.—Mayor O'Neill favors a change in the speed ordinances of the city permitting street cars to run 8 miles an hour in the congested district and 12 miles outside, but he is opposed to 10 miles in the congested district and 15 miles outside, as advocated.

\$22,000,000 New Work on City Transit Lines

Boston, Mass.—The following are the extensions to Boston's transit system, either in progress of construction or contemplated in the near future:

In Progress

Tunnel from Park street to Harvard square; length 3 1-16 miles; cost \$9,500,000.

Contemplated

The Riverbank subway, from Park street under the Common along the Charles River at Charles Gate; length 1½ miles; cost \$3,000,000.

Tunnel from Park street to the South Station, connecting the subway with the Washington street tunnel and the Atlantic avenue elevated line.

Extension of the elevated system from Sullivan square to Malden square; length 3½ miles; cost \$3,500,000.

Extension of the Elevated from the North Station to Lechmere court, East Cambridge; length 1 mile; cost \$4,000,000.

Total cost of all improvements estimated at \$22,000,000.

Total length, 9 5-16 miles.

Mayor Considers Application for Trolley Express

Syracuse, N. Y.—Mayor Edward Schoeneck is giving careful consideration to the application of the Syracuse Rapid Transit Company for definite permission to carry express, with a view to seeing that the interests of the public are thoroughly protected. Mr. Schoeneck is said to believe that the interests of Syracuse shippers should be given consideration, but that such limitations should be placed upon any rights accorded the company as will serve to guard the streets from congestion of traffic. He is reported to take the stand that the express right, if granted, should specifically bar heavy freight of all descriptions.

MISCELLANEOUS

Chicago Exhibits Delight Berlin

Berlin, Germany.—Promoters of the unique city-building exhibition which opened May 1 are delighted with the exhibits received from Chicago and declare them an important contribution to the success of the enterprise. Besides the sketches and drawings lately sent by the South Park Commission, the exhibition management is in receipt of 100 pictures forwarded by Architect Burnham, presenting plans for the beautification of Chicago. Directors of the exposition are showing their appreciation of the collection by having thirty of the pictures, greatly enlarged, hung in one of the principal rooms, where they will cover a large part of the wall space.

Municipal Ownership of Baseball His Idea

Chicago, Ill.—Baseball nines as municipal institutions ranking with the fire department and the police force are planned by Ralph Scaritt, manager of the River Forest baseball team. As a starter he will petition the River Forest Village Board for an appropriation to support the village team this year. Mr. Scaritt will submit his ideas to the village boards of Oak Park, Forest Park and Maywood also at their next meetings. His petition says: "Life is not all paved streets, water works and a police force. We can't live rightly by these alone. We must have some sport. If left to itself sport often becomes degrading, but if rightly managed it makes us all happier and life richer. For this reason I approach your honorable Board with a petition for an appropriation of \$500 to enable the River Forest team, which represents all the neighboring villages, to play a pennant-winning series."

Experts to Put Dock Department on Business Basis

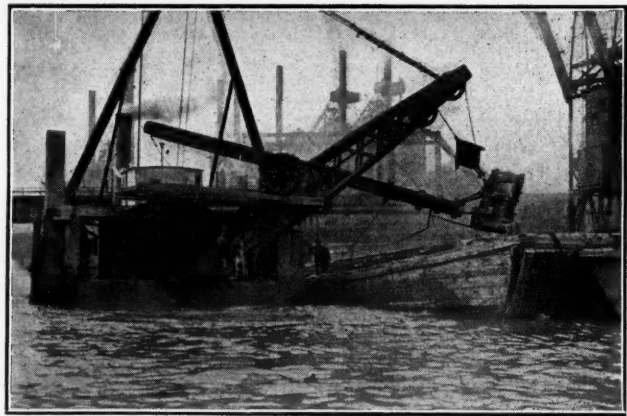
New York, N. Y.—Three experts have been retained by Dock Commissioner Calvin Tomkins to assist him in reducing affairs in the Dock Department to a businesslike basis. They are Dr. Walter N. Polakov, head of the Betterment Engineering Company, 50 Church street, and a graduate of the Polytechnic Institute in Dresden; Frederick A. Reynolds, an engineer, and John J. Kelly, head of the Longshoremen's Union. Each man has agreed to charge the city not more than \$750. Dr. Polakov and Reynolds will introduce modern methods of shop management in the repair yard in West Fifty-seventh street, to make a large saving in salaries and other expenses and to put things in shape so that the city may do much of its own repair work. Kelly has had many years of experience along the water front. The men who work there have complained for years that they suffer from conditions almost unbearable. Commissioner Tomkins desires Kelly to develop a system of shelter houses for longshoremen.

Contractors Must Use City Employment Bureau

Spokane, Wash.—Contractors on city work must hereafter hire men when needed through the City Free Employment Bureau, when it is possible for that office to supply their needs. Such is the substance of a letter sent out to the various contractors by George W. Armstrong, secretary of the Board of Public Works. Complaint was made to the board by Mayor Pratt that a man had complained to him that he had been hired through a private agency and paid \$4.50 for a job with a contractor, and that after working two days he had been discharged. The board has decided to issue a warning to the contractors and to ask them hereafter, when they are short of men, to make application to the City Free Employment Bureau.

Value of City Chemist's Services

Tacoma, Wash.—City Chemist E. O. Heinrich has prepared a partial statement showing the practical value of his services to the city. He has already found that he saved \$38,505 and believes the amount will be doubled in the completed statement. Thousands of barrels of cement and other construction materials were condemned by him which would otherwise have been used in laying new pavements, sidewalks, building reservoirs, etc. The mere existence of the office, he says, has a tendency to keep contractors and supply houses from attempting to use inferior goods.



Courtesy Cleveland Plain Dealer

FIRST MOVE IN DEEPENING CLEVELAND'S HARBOR

Cleveland Dredging Its Harbor

Cleveland, O.—No time was lost by the city in having dredging work started after the passage of the ordinance authorizing the expenditure of \$99,000 for the work. Under the direction of Assistant City Engineer Thomas the dredging was started within 24 hours after the contract with the Great Lakes Dredge & Dock Company was approved by the board of control. The majority of the members of the Council committee on harbors and wharves reported against the expenditure of \$99,000 when the matter was pending in the Council, but the Council voted against the recommendation for a cut in the allowance.

Plan to Reorganize Park Labor System

Los Angeles, Cal.—Judge Charles Silent, of the park commission, has suggested a plan for the reorganization of the labor system in the parks whereby Los Angeles may become known as a center of knowledge of gardening and landscape art, and the city may benefit in direct results. His proposal is that apprentices be employed in the city parks, educated by experts, and promoted as they advance in knowledge and ability. In a report made to the board Judge Silent said: "Let us select a staff of 20 to 25 young lads as apprentices, who can be trained to knowledge and efficiency by actual experience in the parks themselves. Provide for a reasonable promotion, filling vacancies as soon as the promotions occur. Provide for lectures in the field. We have in this city several very able young landscape architects who would for a reasonable compensation render this valuable service. I refer to Ernest Braunton, W. D. Cook, Jr., John D. Shaw and Louis F. Horner. There may be others. Fix the compensation of the apprentices at \$1 a day, gradually advancing the pay as their services become worth more. Much of the labor in our parks which now costs the city \$2.25 a day can be efficiently done by these boys at \$1 a day. Promote these lads from stage to stage and to the higher places as fast as vacancies occur."

Municipal Coal Yard for Milwaukee

Milwaukee, Wis.—One of the first resolutions to be adopted by the socialist régime was offered by Alderman John Hassmann. It provides for the appointment of a special committee to investigate the advisability of acquiring a municipal wood and coal yard in which fuel can be purchased by citizens at cost. It was adopted without opposition.

Ordinance Requires Cleanliness and Silence in Barber Shops

Waterloo, Neb.—An ordinance has been passed by the City Council and signed by the Mayor and is effective at once, which, among other things, regulates matters relative to the cleanliness of barber shops and then provides: "It shall be unlawful for any barber in this town to eat onions between 7 o'clock in the morning and 9 o'clock in the evening. No barber, while shaving a customer, shall insert his thumb or finger in the said customer's mouth; shall not discuss the topics of the town; shall not use tobacco while working over a chair; shall not insist upon a customer having his neck shaved or his hair singed." A violation of any of the provisions shall subject the barber to arrest and fine of not less than \$5 for each and every offense.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities**Municipal Liens—Proceedings to Enforce**

Howell Lumber Co. v. New Brunswick.—Municipalities Lien Law as amended by P. L. 1909, provides that when serving notice of lien, claimant shall file with an official of the municipality a bond conditioned for payment of interest to the contractor in the event of claimant's failure to proceed according to the statute, and provides that nothing contained in the law shall affect the validity of claims or liens due under contracts made prior to the act, but that all the proceedings to enforce such lien shall be subject to the provisions of the amending statute so far as applicable. No bond was required by the former act. Held, that the phrase "proceedings to enforce" does not include the filing of the claim itself, so that a claim due under a contract made prior to the act must be accompanied by the bond required by the amending act; "proceedings to enforce" referring to such proceedings had after the claim is duly perfected.—Court of Chancery of New Jersey, 75 A. R., 750.

Public Improvements—Certificates

Graham v. Borough of Etna.—Where a contract for labor and material calls for the certificate of the engineer and supervisor, the certificate of the engineer alone is not conclusive. The same is true when the contract provides for payment upon the completion of the work, the certificate of the engineer, and the acceptance by the borough. In either case the question of completion and acceptance is for the jury.—Supreme Court of New Jersey, 75 A. R., 749.

Public Improvement—Review—Laches

Whitney Glass Works v. Glassboro Tp. in Gloucester County.—If the prosecutor suffers a public work, on account of which his property may properly be assessed for benefits, to proceed for several weeks without applying for a writ of certiorari to review the validity of the ordinance requiring such work to be done, and only applies for the writ after the work is nearly completed at a large expenditure of public moneys, the writ will be refused, or, if allowed, will be dismissed when these facts are brought to the attention of the court.—Supreme Court of New Jersey, 75 A. R., 756.

Street Opening—Inaccuracies in Map

Neumann v. City of New York et al.—Where a petition was for the appointment of commissioners to open a street to the ocean, and the high-water mark of the ocean was several feet south of the southerly end of the street as shown by the commissioners' map, in view of the shifting character of the high-water line of land fronting on the ocean, and of the character of the proceedings, which clearly indicated a purpose to open the street to the ocean, they were effective to open it to the ocean, notwithstanding the inaccuracy of the map.—New York Supreme Court, 122 N. Y. S., 62.

Track Elevation—Release from Damages

City of Chicago v. Pittsburg, C., C. & St. L. Ry. Co.—Where an ordinance lawfully releases a railroad from damages accruing to the city from the erection of viaducts under a prior ordinance, in consideration that the railroad shall elevate its tracks, the city is estopped to claim the invalidity of the ordinance because not published as required by law, and recover the damages released, the railroad having accepted the ordinance and spent a large sum in elevating its tracks.—Supreme Court of Illinois, 91 N. E. R., 422.

Street Improvement Assessments—Appeal

City of Crawfordsville vs. Brown.—Under Acts of 1905, providing for assessment of benefits for street improvements, and declaring that the report of appraisers shall be final and conclusive on all parties thereto, no appeal lies from such report of appraisers.—Appellate Court of Indiana, 91 N. E. R., 252.

Public Improvements—Assessments

Irving Real Estate Co. v. City of Portland et al.—An amendment to a city charter provided that all water mains should be laid and assessed and paid for as provided in article 6 of the charter relative to sewers and drains, and that the provisions of B. & C. Compilation, § 2727, shall be applicable. Section 2727 provides that an assessment for a street improvement may be paid by installments. The method of constructing sewers under article 6 is by assessment on adjacent property; but the particular method of making the assessment is contained in article 7. Articles 6 and 7 deal in their general scope with the same subject. They are sectionized consecutively, beginning with section 389 of the charter, and running to section 421. Held that, though article 7 was not mentioned in the amendment, its provisions were adapted for water main improvements.—Supreme Court of Oregon, 107 P. R., 955.

Water Works Bonds—Validity

Wood v. Ross, Mayor, et al.—The constitutional amendment, authorizing the issue of bonds by a town on the vote of electors, to be used for building, erecting, establishing and maintenance of water works, should be construed as denoting such singleness of the objects expressed as to dispense with the necessity of stating separately the amount for maintenance and that for building, erecting and establishing, on submission of the question of a bond issue to the voters.—Supreme Court of South Carolina, 67 S. E. R., 449.

Assessment—Diverting Stream

Greater Newark Associates v. Comptroller of City of Newark et al.—An assessment on lands for the benefits conferred thereon by grading a city street will not be set aside merely because, in executing the improvement, the city diverted a stream of water onto the property assessed.—Supreme Court of New Jersey, 75 A. R., 745.

Public Improvements—Review

Cook v. Borough of Allendale; Naugle et al. v. Same.—Section 92 of the borough act of 1897 provides that no writ of certiorari shall be allowed to set aside any assessment for a street improvement, after 30 days shall have elapsed from the date of the confirmation of such assessment by the Council. Held, that the borough act is constitutional in respect of the provisions empowering Council to pass an ordinance for the widening and straightening of a street, and empowering Council to appoint commissioners for the assessment of damages and benefits, and empowering Council to modify or confirm the report of the commissioners. Further, held, that a writ of certiorari applied for after the expiration of the statutory period of 30 days will be refused.—Supreme Court of New Jersey, 75 A. R., 769.

Power to Issue Bonds—Statutes

City of Hazlehurst v. Mayes.—A city which is authorized by the Code, to purchase and hold real estate for parks, may not issue bonds to purchase real estate therefor, since sections authorizing the issuance of bonds for the enumerated objects do not authorize the issuance of bonds for such a purpose.—Supreme Court of Mississippi, 51 S. R., 890.

Grading Streets—Negligence—Liability

Hume v. City of Des Moines.—A city establishing the grade of a street must in bringing the street to the grade exercise ordinary care, and where it unnecessarily or negligently fills drains in the street while bringing the street to the grade, and thereby casts surface water back on an adjacent lot, without notice to the owner and without giving him a reasonable time to bring the lot up to the grade, it is liable for the resulting damages.—Supreme Court of Iowa, 125 N. W. R., 846.

Public Buildings—Contracts

City of Ida Grove v. Ida Grove Armory Co.—A city erecting a city hall without any contract for a party wall may through its proper officers without the vote of the people, on a fair consideration, consent to the use of a wall as a party wall by the adjacent owner.—Supreme Court of Iowa, 125 N. W. R., 866.

Police Power—Scope

City of St. Louis vs. King.—Revised Statutes of 1899 provides that any municipal corporation having authority to pass ordinances regulating matters on which there is a general State law, unless otherwise prescribed or authorized by some special provision of its charter, shall confine its jurisdiction to ordinances in conformity with the State law. The Constitution provides that the charter and amendments thereto of the City of St. Louis shall always be in harmony with and subject to the Constitution and laws of Missouri. Revised Statutes of 1899 prohibit obscene and licentious publications, and those of indecent and scandalous character. Held, that Revised Ordinances of the City of St. Louis relating to obscene newspaper advertisements, which goes farther than the legislative enactment, is invalid, in the absence of authority expressly given by charter or indispensably necessary to the powers expressly granted.—Supreme Court of Missouri, 126 S. W. R., 494.

Officers—Torts

Hathaway vs. City of Everett.—Policemen and assessors, although elected or appointed by a municipality, in invading the premises of plaintiff, assaulting and robbing him, and fraudulently excessively overvaluing his real estate for purposes of taxation, so that he was compelled to pay taxes fraudulently assessed, were not acting as servants of the city, but as public officers, for whose tortious acts the municipality was not responsible. Where plaintiff claimed defendant city liable in tort for injury to his property caused by persons riotously assembled, but the declaration contained no count under Revised Laws, allowing a recovery from a city in an action for tort for property of the value of \$50 or more destroyed by twelve or more persons riotously or tumultuously assembled, if the owner used all reasonable diligence to prevent its destruction, it was proper to order a verdict for defendant.—Supreme Judicial Court of Massachusetts, 91 N. E. R., 296.

Taxation—Scope of Power

Federal Street & Pleasant Valley Passenger Railway Company et al. vs. City of Pittsburg et al.—The consolidated city of Pittsburg has power to tax all taxable subjects as they existed at the time of consolidation, but cannot extend the territorial limits of a local act so that a new subject of taxation will be created and property made taxable in a locality where neither by general nor local laws was such property ever taxable before.—Supreme Court of Pennsylvania, 75 A. R., 662.

Misfeasance of Officers—Liability

Edson vs. City of Olathe.—The State does not guarantee the judgment or fidelity of its officers and agents in their conduct of political affairs, and municipal corporations, erected for purposes of local government, are not liable for misfeasances of their officers, when acting in a governmental capacity with respect to matters of general public concern. The principle of respondeat superior does not apply in such cases.—Supreme Court of Kansas, 107 P. R., 539.

Power to Incur Debts

Palmer vs. City of Helena et al.—A city indebted beyond the constitutional limitation may not use its revenues derived from any source to acquire an electric light plant to supply itself and its inhabitants with light while it has an available source of supply sufficient to meet the requirements, nor levy a tax for that purpose, though Revised Codes, Sections 3287, 3288, authorize such a city to conduct its affairs on a cash basis and pay reasonable and necessary current expenses out of current revenues.—Supreme Court of Montana, 107 P. R., 512.

Bonds—Submission to Voters

Ellison et al. vs. Town of Williamston et al.—The Legislature having by Priv. Laws 1907 conferred power upon Town Commissioners of Williamston to submit to the voters of the town a proposition to issue bonds to furnish electric lights, which is a necessary expense, it was equivalent to a legislative requirement that the sense of the voters should be had before the undertaking was entered upon.—Supreme Court of North Carolina, 67 S. E. R., 255.

Management of Water Works—Extensions of Mains

Browne vs. City of Bentonville.—Kirby's Digest provides that, where water works have been constructed by an improvement district, the City Council shall have full power to operate and maintain the same, instead of the improvement district commissioners, and may supply water to private consumers, and apply the income to operating expenses and maintenance. Held that, where a city took over a water works system of an improvement district, the City Council acted in a governmental capacity in operating and extending the system; and hence could not be compelled by mandatory injunction to extend a water main so as to provide adequate fire protection.—Supreme Court of Arkansas, 626 S. W. R., 93.

Encroachments on Streets—Action for Removal

City of New York vs. Rice et al.—Any erections of permanent and substantial structures on a street not for a public use are an encroachment or obstruction constituting a public nuisance. Under Charter of New York, providing that the municipal assembly shall have power to regulate the use of streets, but shall not have power to authorize the placing or continuing of any encroachment or obstruction on a street except the temporary occupation thereof during the erection or repairing of a building on a lot opposite the same, denies to municipal authorities any power to consent to the private use of any part of a street as laid out. An action to enjoin the maintenance of a masonry wall encroaching upon a street and for its removal brought after demand by the city authorities for the removal of the wall was maintainable in equity.—Court of Appeals of New York, 91 N. E. R., 283.

Road Taxes—Recovery of City from County

Tillamook City vs. County Court of Tillamook County et al.—Where a city authorized to levy only 1½ mills for street purposes levied no tax for such purpose, but the county without authority levied a tax of 8 mills on the inhabitants of the city for road purposes, the city could recover from the county only the tax collected to the amount of 1½ mills, the city being unauthorized to ratify the unlawful act of the county and claim for itself that neither it nor the county was entitled to take in the first instance.—Supreme Court of Oregon, 107 P. R., 482.

Dumping Garbage—Damages

Brennan vs. City of Albany.—Where private land was used without authority as a dumping ground under the direction of city employees, and was afterward leveled off by them for use as a ball field, such work was not a function of the government of the city, and all the acts were ultra vires, and hence the city was not liable for damages sustained by the owner of adjoining property, who was injured by water flowing on his premises because of such work.—Albany County Court, 121 N. Y. S., 895.

Obstruction of Street—Actions—Laches

Hilton vs. City of New York et al.—The fact that an abutting owner, suing to restrain obstruction of a street and to compel removal of existing obstructions, delayed about ten years after the first obstruction was placed therein, does not show him guilty of laches precluding any remedy.—Supreme Court of New York, 121 N. Y. S., 759.

Civil Service Employee—Removal Without Hearing

Neal vs. City of New Haven.—Relator was appointed as examiner of records by the Director of Public Works of New Haven, but became ill on January 16, 1908, and continued so until May 22, 1908, when he again presented himself for work. His salary was allowed until February 18, and on April 6 the Director of Public Works notified him that he would be required to resign on April 13, 1908, if he could not resume work by that date, but relator did neither, and requested an extension of time, and the Director did not fill the position until May 5, when he appointed another thereto. Relator's dismissal was in good faith, and not for political reasons. Held, that the civil service laws only required that an employee should not be removed except for cause duly shown, not including political causes, after examination and appointment, and relator's removal without a formal hearing was not, under the circumstances, in violation of the civil service laws.—Supreme Court of Errors of Connecticut, 75 A. R., 708.

NEWS OF THE SOCIETIES

Second National Conference on City Planning and the Problems of Congestion.

In accordance with a resolution passed at the National Conference on City Planning in Washington, D. C., last year, the Conference met for the second time May 2 to 4, in the lecture room of the Chamber of Commerce, Rochester, N. Y. George Dietrich, president of the chamber, introduced Mayor Hiram H. Edgerton, who delivered an address of welcome to which Clinton Rogers Woodruff, Philadelphia, responded. Frederic Law Olmsted, Harvard University, presented a general introductory paper. A tour of the city was made in automobiles in the morning. In the evening a reception was held at the residence of Charles Mulford Robinson, where those attending the conference had the opportunity of meeting on another informally. On Tuesday the general subject of all papers concerned the causes of the congestion of population. The papers were as follows:

Introductory Outline of the Causes of Congestion of Population, Benjamin C. Marsh, Secretary of the Committee on Congestion of Population in New York City.

Immigration and Congestion of Population, Hon. William S. Bennet, member of Congress from New York City, member of the Federal Immigration Commission.

Causes of Congestion in Chicago, George E. Hooker, Secretary City Club, Chicago.

Causes of Congestion in Philadelphia, Gustavus A. Weber, Secretary Octavia Hill Association, Philadelphia.

Causes of Congestion in Boston, Edward T. Hartman, Secretary Massachusetts Civic League.

Introductory Outline, Grosvenor Atterbury, member Tenement House Committee of Charity Organization Society, New York City.

The Safe Load of Population on Land, Lawrence Veiller, Director National Housing Association.

The Interdependence of the Social and the Architectural, George B. Ford, Architect, New York City.

Inexpensive Homes of Reinforced Concrete, Milton D. Morrell, Architect, Washington.

Municipal Taxation and Its Effect on the Housing Question, Frederick C. Howe, Board of Realty Assessors, Cleveland, O.

Cutting the Roots of Congestion, Bolton Hall, New York City.

Proper Distribution of Factories, Edward E. Pratt, New York School of Philanthropy.

Villages for Workingmen and Workingmen's Homes, Warren H. Manning, Landscape Architect, Boston, Mass.

The Co-Partnership Principle, Robert A. Pope, Landscape Architect, New York City.

The annual banquet was held in the evening at the Hotel Seneca. Dr. Rush Rhees, of the University of Rochester, presided, and introduced the following speakers: J. Horace McFarland, President of the American Civic Association; J. J. Murphy, Tenement House Commissioner of New York City; Leslie W. Miller, Secretary of the Fairmount Park Association, of Philadelphia; Joseph T. Alling, of Rochester, and Edward L. Smith, the Mayor of Hartford, Conn.

On Wednesday the program concerned questions of the circulation of freight and passengers, street widths, methods of acquiring land for public use and legal and administration problems. The papers read were as follows:

Railroads—The Framework of the City Plan; The Problem and Its Study, George R. Wadsworth, American Society Civil Engineers, Consulting Engineer Metropolitan Improvement Commission, Boston.

The Relation of the Street Plan to Traffic Needs, James S. Pray, Assistant Professor of Landscape Architecture, Harvard University, Fellow American Society of Landscape Architects.

Rapid Transit in Relation to the Housing Problem, Henry C. Wright, New York City.

Seaport Congestion and Its Relation to Transportation and Terminal Facilities,

Hon. Calvin Tomkins, Dock Commissioner, New York City.

Planning of Undeveloped City Areas; Methods and Opportunities, Nelson P. Lewis, American Society Civil Engineers, Chief Engineer Board of Estimate and Apportionment, New York City.

Street Widths and Their Subdivisions, John Nolen, Fellow American Society of Landscape Architects, Cambridge, Mass.

Covered Ways for a Business District, Sylvester Baxter, Secretary Metropolitan Improvement League, Boston, Mass.

Excess Condemnation and Public Use, Andrew W. Crawford, Assistant City Solicitor, Philadelphia, Pa.

The Problem of Extending the City Plan, Major Joseph W. Shirley, Chief Engineer, Baltimore Topographical Survey, Baltimore, Md.

The Commission on the City Plan of Hartford, Conn., Frederick L. Ford, American Society Civil Engineers, City Engineer, Hartford, Conn.

The English Town Planning Act of 1909; Some Methods of Acquiring Land for Public Use, Flavel Shurtleff, Attorney-at-Law, Boston, Mass.

At a short business session, preceding the regular afternoon session, was decided that the conference next year should extend over a period of three days and it was the sense of the meeting that there be as few as possible social events, that all the time possible may be available for business. The place of meeting is to be determined by the Executive Committee.

It was decided that the principal papers to be read at the next conference should be printed in advance and sent to the various delegates, to make possible a thorough and intelligent discussion. The Executive Committee was also authorized to carry on a propaganda and if necessary to arrange for an exhibit of the works of the conference.

A resolution was passed that the Executive Committee should endeavor to arrange for a theoretical exhibition of city planning, to put forth the general ideas of the conference, and to show what could be done in remodeling large cities in the United States; that this exhibition should be national in character and that large prizes should be offered, to be given by the Federal Government; that the exhibition should be held four or five years hence, as it will take a lot of preparation, and that the various municipalities should be asked to co-operate in this if the Executive Committee found the plan feasible.

Technology Club of Syracuse.—David R. Cooper of Albany, Secretary of the New York State Water Supply Commission, gave an illustrated lecture before the Technology Club of Syracuse, at the clubrooms in the Bastable Block, April 27, on "Water Resources of New York State." He showed charts of the water-power possibilities of the various rivers and streams and pictures of the falls and flood scenes. Mr. Cooper explained that large dams along the upper sections of the Genesee River would furnish a reserve water supply for power purposes, and at the same time would be a means of protection from floods in the lower regions. A portion of the lecture was devoted to the Adirondack river and streams.

Engineers Club of Cincinnati.—At the regular monthly meeting at the Literary Club, Paul Hansen, Acting Chief Engineer, Ohio State Board of Health, urged the members of the club to advocate definitely the improvement of Mill Creek. Mr. Hansen dwelt at length on the different methods of sewerage, illustrating his lecture with photographs of various sewage disposal plants in Ohio.

State Highway Commissioners and Engineers.

A convention of State Highway Commissioners and engineers of State Highway Departments is to be held in Chicago on May 13 and 14. The meetings will be held at the La Salle Hotel, and a visit will be made to the convict quarry and crushing plant operated in connection with the Illinois State Penitentiary at Joliet. The meeting has been called by a preliminary organization, the Central Highway League; Chairman, A. N. Johnson, M. Am. Soc. C. E., State Highway Engineer of Illinois, Springfield, Ill.; Secretary, Thomas H. MacDonald, State Highway Engineer of Iowa, Ames, Iowa.

Good Roads Congress, South Bend, Ind.

The South Bend Chamber of Commerce has called a good roads congress in South Bend on Thursday, May 19, following just a week later the third annual convention of the Michigan Good Roads Association, which will be held in Grand Rapids, Mich., May 12. The South Bend congress will embrace most of the counties of northern Indiana and is intended to be the initial movement of a State-wide campaign for better public highways in Indiana. It is hoped the congress will take action which will influence the next Indiana Legislature, meeting in January, 1911, to improve and strengthen the road laws of Indiana. The South Bend congress is in charge of the city neighbors subcommittee of the municipal affairs committee of the South Bend Chamber of Commerce. Postmaster Cadmus E. Crabill, chairman of the subcommittee, has appointed the following committees to have charge of the details of the coming congress: Invitation, F. A. Miller, C. N. Fassett, L. P. Hardy, H. D. C. Van Asmus, Cadmus E. Crabill; Program, H. D. C. Van Asmus, Rev. John F. DeGroot, Irving A. Sibley, Sr., J. Augustine Smith, Cadmus E. Crabill; Entertainment, William Happ, H. G. Miller, Samuel Spiro, H. G. Christman, H. I. Purcell.

Commercial Club of St. Paul.—Louis Betz, former City Comptroller, delivered a lecture May 9 before the Credit Men's Association in the Commercial Club, on "The Capitol Approaches and the General Beautification of St. Paul." The lecture was illustrated with stereopticon views.

National Association for the Study and Prevention of Tuberculosis.

The sixth annual meeting was held at the New Willard, Washington, D. C., May 2-4. The executive secretary, Dr. Livingston Farrand, reported an increase in local associations, dispensaries, hospitals, sanitariums, etc., during the year, as follows: Associations in 1909, 297; in 1910, 491; dispensaries in 1909, 222; in 1910, 286; sanitariums in 1909, 294; in 1910, 393; beds available for consumptives in 1909, 15,244; in 1910, 22,720.

Harvard Engineering Society of New York.—The annual meeting with the election of officers will be held June 10. A special tugboat accommodating about seventy-five has been chartered for an afternoon excursion to the Raritan Copper Works at Perth Amboy.

Municipal Art Society of Baltimore.

—the society has given the Home Gardens Committee \$50 to offer as prizes for the best window box and the best back yard. A trained gardener will be engaged this year to visit the homes of those interested and give them practical advice and instructions.

Second and Third Class Cities of New York.—As the result of a referendum vote of the Mayors of the State, taken recently at the suggestion of Mayor Charles C. Duryee, of Schenectady, a conference of the chief magistrates and other officials of second and third class cities will be called to consider those phases of municipal administration pertaining to public health. The conference, which will be strictly informal and unofficial in character, will be held in Schenectady, probably on Thursday and Friday, June 9 and 10. Pursuant to the suggestion of a considerable number of the Mayors, Mayor Duryee has appointed the following advisory committee on arrangements: Mayor James B. McEwan, of Albany; Mayor Elias P. Mann, of Troy; Mayor Otto Pfaff, of Oneida; Mayor Seely Conover, of Amsterdam, and Mayor John K. Sague, of Poughkeepsie. Local committees will arrange the details of the conference and for the entertainment of the visiting officials and their wives, and the expenses of the conference will be borne by the citizens of Schenectady. Among the subjects to be discussed will be the following:

1. "Municipal Hospital Care of Contagious Diseases."
2. "Municipal Duties in the Conquest of Tuberculosis."
3. "The Housing Problem and Health."
4. "The Prevention of Disease by the Elimination of Dust—Modern Methods of Street Cleaning, and the Care of Public Buildings, Including Proper Ventilation."
5. "What the Small City Can Do to Protect the Food Supply of Its People."
6. "The Organization and Work of an Effective Health Department."
7. "The Protection of Life vs. the Protection of Property—The Health Inspector, the Policeman and the Fireman."
8. "Where Shall We Get the Money for Municipal Health Activities?"

Washington Society of Fine Arts.—"The Betterment of Washington" was the subject of discussion at a public meeting arranged by the Washington Society of Fine Arts in Continental Memorial Hall.

The object of the society is to make Washington the model city of the nation, and all organizations interested in the welfare of the National Capital were urged to attend the meeting and to join the movement. Thomas Nelson Page, the president of the Society of Fine Arts, made the opening address. The rest of the program was as follows: "Municipal Art," Maj. W. V. Judson, Engineer Commissioner; "What the Citizens Can Do," Glenn Brown, chairman of civic art committee; "Washington Playgrounds," Henry B. F. Macfarland, former Commissioner; "A Garden City," David Fairchild, president of the People's Gardens Association; "The Decoration of Public Schools," Miss Leila Mechlin, president of the League for the Decoration of Public Schools; "The American Federation of Arts," F. D. Millet, secretary.

Calendar of Meetings

- May 12-14.
Southwestern Electrical and Gas Association.—Sixth Annual Convention, Beaumont, Tex. Edward T. Moore, Secretary.
- May 17-19.
National Fire Protection Association.—Annual Meeting, Chicago, Ill.—Franklin H. Wentworth, Secretary, 87 Milk Street, Boston, Mass.
- May 18.
American Society of Civil Engineers.—Regular Meeting, Society House, New York.—Charles Warren Hunt, Secretary, 220 W. 57th st., New York, N. Y.
- May 23-28.
National Electric Light Association.—Annual Meeting, St. Louis, Mo.—T. C. Martin, Secretary, 29 W. 39th st., New York.
- May 27-29.
Louisiana State Firemen's Association.

—Fifth Annual Convention, Lafayette.—Wm. J. Kleinpeter, Secretary, Gretna, La. May 31-June 3.

American Society of Mechanical Engineers.—Spring Meeting, Atlantic City, N. J.—Calvin W. Rice, Secretary, 29 W. 39th st., New York.

June 1-4.
Engineers' Society of Pennsylvania.—Second Annual Convention, State House, Harrisburg, Pa.—Edward R. Dasher, Secretary.

June 2-3.
North Carolina Municipal Association.—Annual Convention, Winston-Salem, N. C.—O. B. Eaton, Secretary, Mayor, Winston-Salem, N. C.

June 7-11.
Playground Association of America.—Fourth annual congress, Rochester, N. Y. H. S. Braucher, Secretary, 1 Madison avenue, New York City.

June 9-11.
National Association of Comptrollers and Accounting Officers.—Fifth annual convention, Hotel Astor, New York City.

June 21-24.
American Society of Civil Engineers.—Annual Convention, Chicago, Ill.—Charles Warren Hunt, Secretary, 220 W. 57th st., New York City.

June 22.
New England Water Works Association.—June Outing, Providence, R. I.—Willard Kent, Secretary, Narragansett Pier, R. I.

June 21-23.
Indiana Municipal League.—Annual Convention, Richmond.—Baltz A. Bescher, Secretary, Richmond, Ind.

June 22-24.
American Institute of Chemical Engineers.—Semi-annual Meeting, Niagara Falls, N. Y.—J. C. Olsen, Secretary, Polytechnic Institute, Brooklyn, N. Y.

June 23-25.
Society for the Promotion of Engineering Education.—Annual Meeting, Madison, Wis.—Henry H. Norris, Secretary, Cornell University, Ithaca, N. Y.

June 27-30.
American Institute of Electrical Engineers.—Annual Convention, Jefferson, N. H.—R. W. Pope, Secretary, 33 West 39th st., New York City.

June 28-July 2.
American Society for Testing Materials.—Annual Meeting, Atlantic City, N. J.—Edgar Marking, Secretary, University of Pennsylvania, Philadelphia, Pa.

June 30-July 1.
American Society of Heating and Ventilating Engineers.—Semi-annual Meeting, St. Louis, Mo.—W. M. Mackay, Secretary, P. O. Box 1818, New York, N. Y.

August 17-20.
National Firemen's Association.—Thirteenth Annual Convention, Rochester, N. Y.—Bert Fisher, Secretary, 3812 Wabash ave., Chicago, Ill.

August 23-26.
League of American Municipalities.—Annual Convention, St. Paul, Minn.—John MacVicar, Secretary, City Hall, Des Moines, Ia.

August 23-26.
International Association of Fire Engineers.—Annual Convention, Syracuse, N. Y.—James McFall, Secretary, Roanoke, Va.

September 21-23.
New England Water Works Association.—Annual Meeting, Rochester, N. Y.—Willard Kent, Secretary, Narragansett Pier, R. I.

PERSONALS

BENNETT, J. W., Albuquerque, N. M., Superintendent of the Water Works, has been made head of the Department of Streets and Alleys, Sprinkling, Garbage Contracting and Water and Sewer Works.

BIXBY, COL. WILLIAM H., has been appointed Chief of Engineers, U. S. A., succeeding Gen. William L. Marshall.

BROCKET, D. GUY, Elizabeth City, N. C., has been elected Chief of the Fire Department.

CLARK, HORACE B., Hartford, Conn., has been re-elected President of the Fire Board.

DAME, CHARLES A., North Andover, Mass., has been appointed Chief of the Fire Department.

DAVIS, FRED, Morgantown, W. Va., has been elected City Engineer; Jasper Taylor, Chief of Police; John Han, Chief of the Fire Department, and Andy Frost, Street Commissioner.

DUKES, DR. CHARLES A., Oakland, Cal., has been re-elected President of the Board of Health.

FAWCETT, A. V., Tacoma, Wash., has been elected Mayor under the commission plan. The following have been elected Commissioners: Michael Lawson, Ray Freeland, L. W. Roys, Owen Woods. John F. Meads was elected Comptroller.

FRY, VERNE D., Iola, Kan., has been appointed City Engineer; Joe McCarty, Fire Chief.

GIBBS, W. H., Columbia, S. C., has been elected Mayor under the new commission form of government.

HAMM, JOHN, Fulton, W. Va., has been elected Street Commissioner.

HARRIS, W. T., Leesville, La., has been elected Mayor.

HUBBELL, WALTER W., Bridgeport, Conn., one of the Assistant City Engineers, has been appointed on the staff of State Highway Commissioner James H. MacDonald.

KELLER, HERBERT P., St. Paul, Minn., has been elected Mayor over Mayor Henry G. Haas.

KELLY, FISHER, McKeesport, Pa., has been elected President of the Water and Light Commissioners. David M. White has been elected Superintendent to succeed T. H. Verner, resigned.

KUHL, WILLIAM, Ventnor, N. J., has been elected Chief of the Fire Department.

LANGFITT, COL. WILLIAM C., Washington, D. C., has been ordered to relieve Capt. Warren T. Hannun of charge of the District Water Supply System and the Improvement of the Potomac River.

MCINTOSH, CHARLES LYON, Racine, Wis., Treasurer of the J. I. Care Threshing Machine Company, died at Naples, Italy, April 19.

McKAY, D. B., Tampa, Fla., editor of the Tampa Times, has been nominated for Mayor at the primary.

McNEIL, W. T., Bellevue, Tex., has been elected Mayor at the first municipal election.

NELSON, A. C., Alice, Minn., has been elected President of the new village.

REYNOLDS, JOHN W., Chief of Police of Newport News, Va., has resigned, and will probably become Detective Sergeant, which position he filled before his promotion, six years ago.

RICHARD, JOHN B., Chief of Detectives of Sioux City, Ia., has been appointed as Chief of Police to succeed John Dinneen, who served six years.

ROBINSON, ALDERMAN W. F., El Paso, Tex., has been elected Mayor, succeeding Joseph U. Sweeney, resigned.

SANDO, WILL J., Milwaukee, Wis., has resigned as manager of the pumping engine department of the Allis-Chalmers Company, and will give his time to the interests of the Sando Engineering Co., Boston, Mass.

SHUTE, GEORGE P., Columbus, O., civil engineer, has been appointed by Mayor Marshall as head of the garbage collecting and disposing department, succeeding Robert Wachter, resigned.

SMITH, DR. L. A., Port Gibson, Miss., has been elected Mayor.

TAGGART, WILLIAM J., Wilmington, Del., has been elected a Second Assistant Engineer of the City Engineering Department.

TALBERT, JOHN T., Hagerstown, Md., has been appointed Chief Fire Marshal.

THEON, GEORGE L., Consulting Engineer, Chicago, Ill., is gathering data for the sewerage experts who will meet in Milwaukee next month to decide on improved conditions for the city.

TOWNSEND, WILLIAM, Canandaigua, N. Y., has been elected Chief of the Fire Department.

WEINERT, HILLMAN R., Seguin, Tex., is said to be the youngest Mayor in the country. He is 22 years old and graduated from the University of Texas last year.

WERTENBAKER, DR. WILLIAM, New-castle, Del.; Wallace L. Cannon, Patrick Whalen, William Weggemann and William Cramer have been appointed members of the new Board of Health.

WHELTLE, JOHN B. A., Baltimore, Md., has been elected Police Commissioner to succeed Colonel Sherlock Swann, resigned.

WILLIAMS, M. A., Seguin, Tex., has been elected Chief of the Fire Department; R. J. Willmann, Assistant Chief; Max Starcke, President, and George J. Kempen, Secretary.

WOOLEY, W. THOMAS, Hoosic Falls, N. Y., has been appointed Engineer of the Public Improvement Commission. Mr. Wooley was formerly City Engineer of Auburn.

NEWLY ELECTED MAYORS.

Maryland

Berlin—J. D. Henry.
Clearspring—John C. Douns.
Funkstown—Albert Ingram.
Easton—M. M. Higgins.
Hyattsville—W. C. Magradie, re-elected, over Dr. Thomas E. Latimer.
Emmertsburg—Samuel L. Rowe, first Mayor.
Garrett Park—John Wesley Stone over Frederick W. Hodge.
Glen Echo—Clarence B. Wilson.
Hempstead—J. Frank Switzer.
Mt. Rainier—Robert E. Joyce.
Kensington—John A. Cannon.
Meyersville—Samuel Pottingall.
Rockville—Offutt over Albert Dabley.
Snow Hill—William D. Cordray, Jr.
Westminster—Ernest J. Sponseller.
Tawneytown—Samuel H. Mehring.
New Windsor—Winfield S. Drash.

South Dakota.

Aberdeen—H. J. Rock.
Rapid City—Dr. R. J. Jackson.
Redfield—W. A. Morris.
Sioux Falls—Ira Soule (Commissioner).
Huron—C. F. Koeppe.

NEW MILWAUKEE OFFICIALS

Appointments by Mayor Emil Seidel

Private Secretary—Charles Sandburg, newspaper man.
Health Commissioner—Walter P. Stroesser.
Commissioner of Public Works—Harry E. Briggs.
Trustees of Emergency Hospital Board—Aldermen Max Grass, Fred Braun and Ben. P. Churchill.
Museum Board—Aldermen Henry Smith, C. L. Weiley and E. T. Melms.
Public Library Board—Aldermen Jacob Rummel, Victor L. Berger and August E. Braun.

Walter P. Stroesser, a tailor, has been appointed temporary Commissioner of Public Health by Mayor Emil Seidel to succeed Dr. Gerhard A. Bading; he will assume his duties immediately.

Harry E. Briggs, an instructor in the Trades School, will be Commissioner of Public Works temporarily, it is said, to supplant the present Board of three Commissioners.

Joseph Uihlein, general manager of the Schlitz Brewing Co., has been appointed Commissioner of the Public Debt.

Elected by Council

President of the Common Council—Edmund T. Melms.
City Clerk—Carl D. Thompson, a preacher.

Appointments by City Officials

Deputy City Clerk—Henry Ohls, a union printer.
Deputy Controller—Leslie S. Evarts, a non-Socialist business man.
Deputy City Treasurer—John I. Drew, Deputy Treasurer for many years.

City Attorney's Appointments

First Assistant—John J. Cook.
Second Assistant—Mark Kline.
Third Assistant—Eugene McIntyre.
First Special Assistant—William H. Timlin, Jr.
Second Special Assistant—Clifton Williams.

TRADE NOTES

Cast-Iron Pipe.—Chicago quotations: 4-inch, \$28.50; 6 to 12-inch, \$27.50; 16-inch and up, \$26.50. Birmingham: Inquiries are good. Pipe plants are running to full capacity. Quotations: 4 to 6-inch, \$24; 8 to 12-inch, \$23; over 12-inch, average \$22. San Francisco: The tonnage booked for Coast delivery continues large and there is no sign of a decrease in the immediate future. New York: Business is coming in slowly, but prices are well maintained. Quotations: 6-inch, \$25.50 to \$26.

Lead.—Market is weak. New York, 4.325 c.; St. Louis, 4.175c.

Cement.—The Lehigh Portland Cement Co., Indianapolis, Ind., announce that prices on paper shipments of cement will be advanced at once 5c. per barrel. This will make a difference of 10c. per barrel between the net price in cloth and paper.

Metal Culverts.—The Penn Metal Ceiling and Roofing Co., Ltd., 251 Devonshire street, Boston, Mass., publish a foreman's timebook, which besides the pages containing the usual rulings for time keeping, contains a few sheets explaining the use of their Highway Metal Culvert for Roadways. The culverts are made from special-analysis sheets, pure iron and heavily galvanized. A smooth bottom plate gives free flow of water, does not hold water in corrugations or permit pebbles and debris to wear out high points in corrugations. The bottom member with shoulder angles acts as a reinforcement, gives strength lengthwise of pipe, consequently withstands great pressure.

Conveying Concrete by Air.—The recently organized Concrete Conveyor Company, it is now announced, was formed as a holding company for patents taken out by W. H. Larken on apparatus for conveying concrete from a mixer into place through pipes by means of pneumatic pressure. The company proposes to license manufacturers in this and other countries to make and market the apparatus and it has just closed a contract with the Ransome Concrete Machinery Company, of Dunellen, N. J., awarding that company entire manufacturing rights in the United States. This company, it is understood, will add to its manufacturing facilities in order to construct the new line of equipment.

Pumps.—The Scranton Steam Pump Company, which from the little shop of J. V. Poore ten years ago has grown until now it occupies seven large brick and concrete buildings in an enclosure of five acres, has decided to increase its capital. A first-class modern plant will be installed for making steel casting and for other purposes. John W. Fowler is president.

Removal Notice.—After May 1 the Engineering News Book Department which has been located on the 19th floor will be at Room L, 4th floor, St. Paul Bldg., 220 Broadway, New York City.

Glutrin.—The Robeson Process Company, Au Sable Forks, N. Y., has received an order for eight car loads of glutrin, 8,000 gallons each, from the Commissioners of Monmouth County, New Jersey.

Bitulithic.—The Standard Bitulithic Company, New York, announces the removal of its offices to the Hudson Terminal Bldg., 50 Church street, New York City.

Lock-joint Pipe.—Recent contracts awarded on the use of Meriwether System of reinforced concrete sewer pipe are: Main street sewer, East Orange, N. J.; Roosevelt avenue sewer, East Orange, N. J.; Bergen street sewer, Newark, N. J.; Passaic county Main street drain, Paterson, N. J.; Park avenue drain, Essex County Park Commission, N. J. The company has also received contract to supply some 7000 ft. of pipe in sizes from 30-in. to 46-in. for the city of Brantford, Ontario. The Havana sewerage and paving contract has been awarded for Meriwether construction, there being about 200,000 feet of pipe in sizes from 36-in. to 84-in. The Cuban Engineering & Contracting Co., 17 West Forty-second street, New York City, are contractors for the sewerage portion. This contract in its entirety is probably the largest single sewer contract ever let.

Sewer Construction Cost Table.—H. C. Patterson, Waukegan, Ill., has prepared a table by means of which one may find at a glance the total cost, or each separate item of cost, of constructing sewers of any size from 6 to 24 inches in diameter and of any depth from 4 to 15 feet. It covers the items of trenching, sheeting, laying, hauling, cement, jute and pipe. The table also provides for the difference in costs of pipe and labor in different parts of the country.

Underfeed Stokers.—The following municipal light and power plants are to install Taylor Gravity Underfeed Stokers, manufactured by the American Ship Windlass Co., of Providence, R. I.: City of Grand Forks, N. D., for a 250-hp. boiler; Detroit Public Lighting Commission, Detroit, Mich., for 400-hp. of boilers; Lake City Power & Light Commission, Lake City, Minn., for a 250-hp. boiler.

Portland Cement.—The Alpha Portland Cement Co., 50 Church street, New York City, have published a very handsomely printed and illustrated book concerning Alpha cement and large construction works where it has been used. Among these works are the new bridge over the Connecticut River at Hartford, the shelters at Revere Beach, Mass., masonry in connection with the N. Y., N. H. & H. R. R. grade separation work in New Haven, and the Galveston sea wall.

Record of Work.—Under the caption "Work Done," Westinghouse, Church, Kerr & Company, New York City, publish a handsome booklet, 82 pages, describing and illustrating the various recent installations of which they have had charge. The work includes for the most part electric railways and power stations.

Bituminous Highways.—W. S. Godwin, New York City, has published a little booklet regarding the construction and cost of bituminous highways, as laid with Godwin's Duplex Plant.

Gas Engines.—The Otto Gas Engine Works, Thirty-second and Walnut streets, has let contracts, one for a 30x50-foot addition, another for a 50x92-foot second and third-story addition to its machine shop.

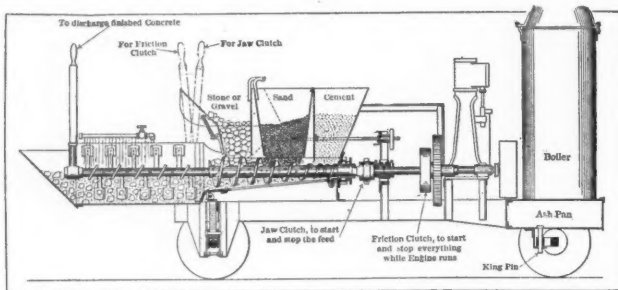
Water Softening.—The Pittsburg Filter Mfg. Company, Pittsburg, has received a contract from the city of Hamilton, Ohio, for a large water-softening plant.

Rock Drills.—The Pittsburg Contracting Company, which is building section 53 of the Catskill aqueduct, N. Y., has placed an order with the Ingersoll-Rand Company for an equipment of air compressors and rock drills.

MUNICIPAL APPLIANCES

Continuous Proportioning Mixer

A CONCRETE mixer claiming the good features of both the continuous and batch types, has been developed by the Svenson-Shuman Machine Company, Bessemer Bldg., Pittsburg, Pa. One shaft which runs at constant speed performs all the work. It measures the three ingredients, mixes them dry and then wet, and finally discharges them. It is stated that the mixer has the smallest number of running parts of any proportioning mixer now on the market, and has no small machinery parts likely to break. The proportioning device consists of the conical screw at the right end of the shaft and two gates. The materials pass from the hoppers into the measuring screw, and the position of the gates in each of the hoppers determines the amount of that ingredient fed by the screw. While the machine is running the proportions can be instantly changed by the hand-



CONCRETE MIXER WITH MEASURING DEVICE

wheel which regulates the size of the gate opening. The mixing chamber is much larger in diameter than the conveyor which feeds it. This prevents it from running full and leaves room for mixing. The mixer is all iron and steel, except two oak running boards. Most of the metal parts are forged and rolled steel, cast-iron being used very sparingly and only where necessary. The engine drives the mixer shaft through two forged steel gears having machine-cut teeth. A friction clutch between the engine and the mixer shaft allows stopping and starting the mixing temporarily, while the engine runs continuously. This clutch is also a safety device in case the mixer should clog as it slips under an overload. All bearings are protected against entrance of sand and dirt, and the one at the discharge end has a cover and interlocking collars. The conveyor screw and the paddle points are chilled to produce a glass-hard surface to withstand wear. The manufacturer furnishes a table indicating the proper position of the cement and sand gates for all the customary proportions of concrete mixtures. To set the gates, enough material is shovelled into each of the

three hoppers to cover the conveyor screw. Then if a 1:2:5 mixture is required, one bucket of cement is placed in the cement hopper, two of sand in the sand hopper and five of stone in the stone hopper. The machine is then started, and if all hoppers empty simultaneously the setting is correct; if not, the regulating wheel is turned until they do, when the test is repeated. Then the hand-wheel can be padlocked and thus absolute uniformity of the mixture insured.

The entire operation of the machine is controlled by one man through three levers. The first opens and closes the discharge gate, the second throws the conveyor screw in and out of gear, and the third controls the friction clutch that transmits the power of the engine to the main shaft. These levers are reached from one position, and as the operator has the water supply under his control and can also watch the hoppers, it is possible to govern the entire operation of mixing from one position. These devices also make it possible to operate this mixer either as a batch or a continuous one. A large storage space in the mixing chamber and the devices for opening and closing the delivery gate and throwing the feed screw in and out of gear combine to make it one of the former type, while by opening the gate it becomes a continuous mixer.

The machine is made in three sizes, having capacities of 7, 12 and 16 cubic yards per hour, weighing 3900, 6000 and 7500 pounds, respectively.

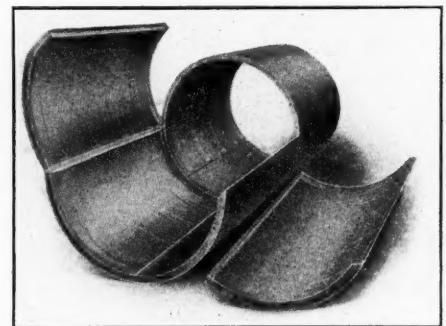
Culvert Mold

THE Blaw patented culvert mold, built in all diameters, ranging from 12 inches to 72 inches, is very simple in construction and design, and works automatically in so much as the act of drawing the mold from the completed work collapses the mold sufficiently to easily remove it from the set concrete. The mold consists essentially of a collapsing apparatus and a one-piece steel shell which laps over itself. The collapsing apparatus consists of a rod running vertically through the mold, to which are connected collapsing arms, which are in turn connected with rods joined to the shell. These connections are in the form of toggles and radiate four ways from the center rod in order to give the form sufficient stiffness. At the bottom of this rod there is an arrangement which allows the form to col-

lapse only the proper distance, and when the form is being reset this arrangement keeps the form at its proper diameter. The principle of operation is as follows: When the concrete is set and the form is ready to be removed the operator grasps the handle and pulls the form out. The act of pulling on this handle both collapses the form and withdraws it. Each section is provided with a butt strap on one end so that any number of sections may be joined together. The mold is made by the Blaw Collapsible Steel Centering Company, Westinghouse Building, Pittsburg, Pa.

Sectional Steel Centering Forms

FOR the economical construction of monolithic sewers, conduits, culverts, etc., of 30 inches diameter and larger, the Besser Manufacturing Company, Alpena, Mich., makes a sectional steel centering form. Each section of form

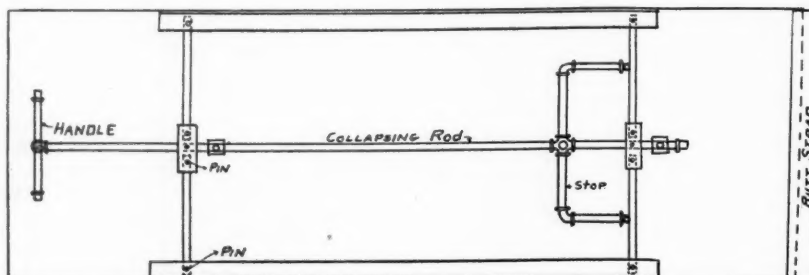


SECTIONAL STEEL CENTERS

is made up of four plates properly shaped so that the entire circle is completed at once, and it is claimed that better results are obtained than where arch and invert are made separately. By this means it is possible to get along with less open trench. Forms are being continually taken down at the back end where the concrete has set, brought through the intervening forms and put in place again. There is a locking arrangement by which the sections are interlocked, and every part brought in perfect alignment. A small track running on a plank track is sufficient for carrying the sections through. These forms are sold, not rented, and are claimed to effect a saving of 25 per cent in labor.

Air and Vacuum Valve

THE purpose of the Crispin automatic air and vacuum valve is to allow air to enter a main while it is being emptied of water and allow air to escape from the main when it is being filled with water. Their use will prevent all blow-out joints, rusted or collapsed pipes due to compressed air or vacuum during the operations of filling and emptying mains. Besides this they save labor as they make it unnecessary to employ men to operate valves by hand to let air in or out. The valve is claimed to be so simple in construction that it is not liable to get out of order. There is only one moving part to the valve and it is water tight. The valves are made in all sizes, from 1-inch up. By a 1-inch valve is meant a valve that will carry as much air out of the main as would a circular opening, one inch in diameter in the wall of the main. The valves are made by the Water Works Equipment Co., 50 Church street, New York City.

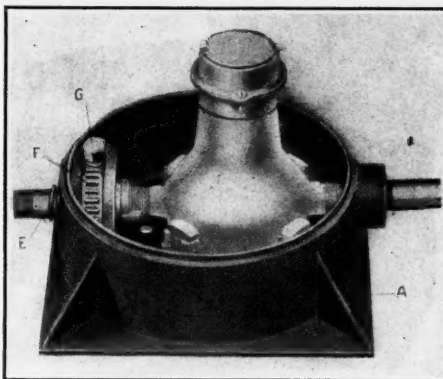


BLAW COLLAPSIBLE CULVERT MOLD

New Meter Box

A NEW meter box, the Columbian, has been placed on the market by the Columbian Iron Works, Chattanooga, Tenn. Referring to the cut, A shows the base; B, the tower casing; C, the upper casing, and D the cover. The upper casing is adjusted to different heights by means of the groove and notches cast on both sides of the lower casing. The cover is of the socket type with four long lugs projecting into the upper casing, thus holding it securely in position, and making it necessary to use a special lifting device to remove the cover. The base has a cast-iron perforated bottom, which prevents the soil from working up around the meter, and at the same time allows water to drain out. In operation, it should be understood that the Columbian Meter Box is designed for setting in the sidewalk. The service pipes are connected to the threaded spud on one side of base, and to the adjustable bronze coupling E, at the opposite side. The meter is then placed in position in the half-collars, which brings the openings in perfect register. The bronze worm-screw G is then rotated by means of a T-handle wrench from the surface, which revolves the worm-nut F, which causes an end-to-end connection to be made against the meter spuds. Leather gaskets are counter-sunk in the base connection at one side, and in the bronze adjustable coupling at opposite side, thus making a perfectly water-tight joint.

All working parts are made of bronze and accurately machine finished. Casing can be adjusted to any height to suit sidewalk elevation. Meter can be taken out and reset from surface by the use of a single T-handle wrench in less time than one minute. By means of the half-collars the meter can only be set in a perfect straight line with service pipe, thus avoiding the frictional loss incident to elbows and bends. By the use of multiple casings, the meter can be set to any depth required. The regular meter couplings are not required in setting meters, thus saving

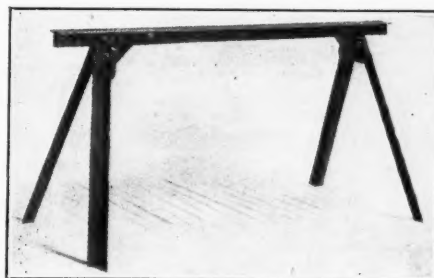


SHOWING BASE WITH METER IN POSITION

from 40 to 80 cents on each meter in accordance with size. More than 10,000 of these boxes have lately been installed in New Orleans in connection with the new water works.

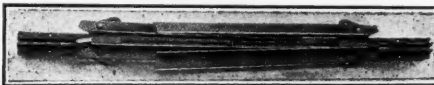
Collapsible Steel Horse

A STRONG, simple and convenient collapsible steel horse or trestle is made by S. M. Hildreth Co., 2 Rector street, New York City. The horse is made in



IRON HORSE—SET UP

sizes from 19 to 37 inches in height and 20 to 40 inches in length. The advantages of the device are that it requires small space in storage or in



IRON HORSE—FOLDED

transportation and is strong and durable. The collapsible horse should be useful to contractors in protecting their work, particularly on streets.

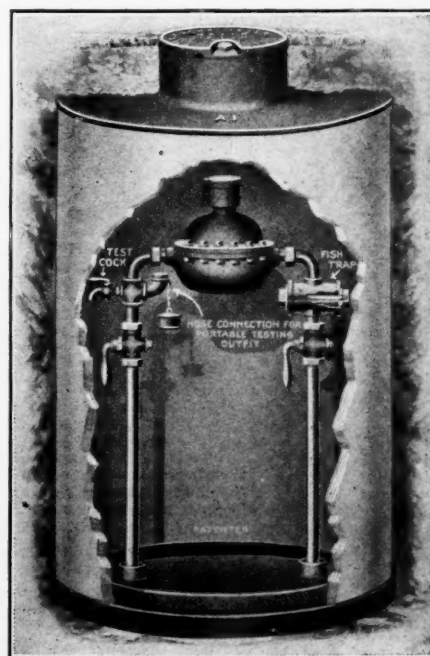
New Water Gate Valve

A TYPE of valve which is a radical departure from the type heretofore manufactured by them has been put on the market under the trade name of "Newtype," by the Kennedy Valve Manufacturing Co. These valves have in the gate a double wedging mechanism, parallel seats and independent stem nut. The waterway is the full diameter of the connecting pipe. The parallel faces of the seat and disc rings move so closely upon each other that all foreign matter that may have collected on these rings is scraped off, allowing perfect compact of seat and disc rings. The valves are so constructed that they work equally well with either disc toward the pressure. The discs, in closing, move to their position opposite their ports, then close squarely against them. The wedges are of solid bronze and act on both discs equally and independently of the stems. The wedging surfaces of the wedges are of the same angle, thus making them interchangeable, and have a free lateral movement

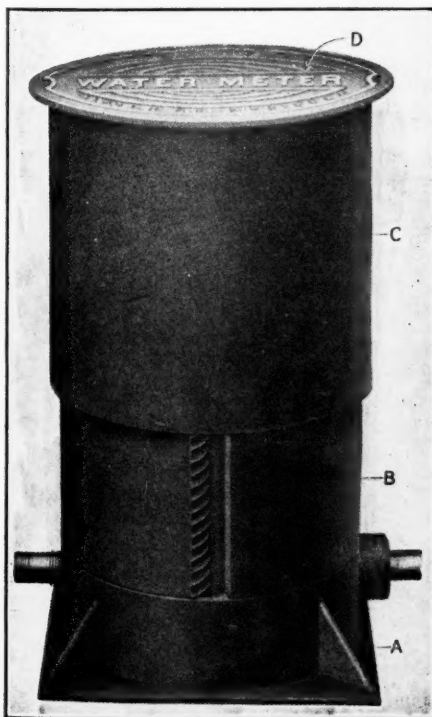
between the discs. In opening the valves, after the first movement of the stem the discs release automatically, the continuance of the movement of the stem completing the operation. The stem nut, of solid bronze, through which the stem revolves, is loose and separate from the discs. One side of this stem nut is thicker than the other, so that in opening one disc lifts ahead of the other, and consequently draws one wedging face directly away to the other, making it impossible for the disc to stick under any circumstances.

Meter Box

THE general principles of the Clark meter box are shown in the illustration. The meter is brought up to a convenient height for reading without danger from frost, even in the coldest climates. No inner cover of felt or other material is used. The box body of vitrified earthenware or concrete extends down to the depth of the service pipe and below the line of frost. The cover is of heavy cast-iron, partially covered over with paving material or earth. The lid of heavy cast-iron is fitted to cover and provided with the Clark perfect locking device. Protection from frost is perfectly secured by the partial burying of the cover (there being only an 8-inch lid exposed to the elements) and by the large air space within box, combined with the large radiating surface of warm earth at the bottom of the box, below the line of frost, permitting warm air to surround the meter and riser pipes. It is essential that the radiating surface be of large area and that the space below the meter, and down to the extreme depth of the box, be left open (not filled in with earth or packing material of any kind) so as to accomplish the heating up of the air within the box from this radiating surface at the bottom. The riser pipes to meter must be kept well away from the walls of box, thus allowing a volume of warm air to occupy spaces between pipes and walls, as were these pipes to come in contact with walls of box they would freeze through induction, and the frost would extend to the meter in the same manner.



CLARK METER BOX



COLUMBIAN METER BOX

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles, where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS

Highway System of New Jersey. Illustrated, 5 pp., Good Roads, April. 10 cts.
Highway System of Los Angeles County, Cal. By B. A. Hinly. Illustrated, 7 pp., Municipal Engineering, May. 25 cts.
Improvement of Minnesota Roads. Paper before Minnesota Good Roads Association. By G. W. Cooley, State Engineer. 3½ pp., Good Roads, April. 10 cts.
Location and Drainage of Highways. By F. D. Lyon, Second Deputy Commissioner, New York Highway Department. 2½ pp., Good Roads, April. 10 cts.
Sand-Clay Roads in the Middle West. From Bulletin of the U. S. Office of Public Roads. 12-3 pp., Engineering Record, April 16. 10 cts. 3 pp., Engineering-Contracting, April 20. 10 cts. 4 pp., Contractor, April 15. 20 cts.
"Rocmac" System of Modern Road Construction. 1 p., Surveyor, April 8. 20 cts.
Road Work, Traction Engines in. ½ p., Municipal Journal & Engineer, May 4. 10 cts.
Tests of Road Materials. Paper before Illinois Society of Engineers and Surveyors. By R. B. Slippy. ½ p., Good Roads, April. 10 cts.
Stone Testing Laboratory, New York State Highway Commission. ½ p., Engineering Record, April 23. 10 cts.
Methods of A New York State Commission of Highways in Testing Bituminous Materials Used in Road Work. 2 pp., Engineering-Contracting, April 27. 10 cts.
Management, Principles of Road. Paper before Ontario Good Roads Association. By T. L. Kennedy. 1 p., Canadian Engineer, April 29. 15 cts.
Road Supervision. Paper before Ontario Good Roads Association. By W. A. McLean, Engineer of Highways. 1½ pp., Canadian Engineer, April 22. 15 cts.
Highway Bridge Foundations, Cost of Abutment Masonry and Slope Paving for, Illinois and Mississippi Canal. 3-4 p., Engineering-Contracting, April 20. 10 cts.
Modern Bridges for Illinois Highways. Illustrated, 1 p., Good Roads, April. 10 cts.
Dust Layer, Dry Calcium Chloride. Account of demonstration at Long Branch, N. J. Illustrated. 1 p., Municipal Journal & Engineer, April 20. 10 cts.
Tar Treatment of Roads. Paper before Illinois Gas Association. By T. P. Sharples. 1½ pp., American Gas Light Journal, May 2. 10 cts.
Tar Macadam Roads. Paper before Illinois Gas Association. By F. E. Newberry. Illustrated, 2½ pp., American Gas Light Journal, May 2. 10 cts.
Bituminous Concrete Paving on Chicago Parkways. Illustrated, 4½ pp., Good Roads, April. 10 cts.
How Maine Builds Bituminous Macadam Roads. 2-3 p., Contractor, April 15. 20 cts.
Pavements of Seattle. Paper before First American Congress of Road Builders. By R. H. Thompson. 2 pp., Canadian Engineer, April 29. 15 cts.
Paving the Streets of London. Report by A. C. Morton, Chairman Metropolitan Paving Committee. ½ p., Local Government Journal, April 2. 10 cts.
Specifications, Pavement. Report of the Committee of Organization for Standardizing Paving Specifications. Brick, granite block and macadam. Bonds and guarantees. 5 pp., Municipal Engineering, May. 25 cts.
Standardizing Paving Specifications. Sheet Asphalt, bituminous concrete, macadam, creosoted wooden block and brick. Specifications adopted by the convention of the Organization of City Officials for Standardizing Paving Specifications. 4 pp., Good Roads, April. 10 cts.
Standard Specifications for Concrete Walks, Curbs and Pavements. 1½ pp., Concrete, April. 15 cts.
Concrete in the Construction of Pavements. Paper before Canadian Cement and Concrete Association. By James Pear-

son. 11-3 pp., Contractor, April 15. 20 cts.; 1½ pp., Canadian Engineer, April 29. 15 cts.
Wood Block Paving, Preservatives for. By C. N. Forrest. 1 p., Engineering Record, April 16. 10 cts.
Asphalt Operations at Indianapolis, Municipal. Communication from Clifford Richardson. ½ p., Engineering Record, April 23. 10 cts.
Prices, Average Unit, and Some Details of Pavements Constructed in 1909. 3 pp., Engineering-Contracting, April 6. 10 cts.
Tables Showing the Amounts and Average Prices of Brick, Asphalt and Creosoted Wood Blocks Pavements Laid in 1909. 3½ pp., Engineering-Contracting, April 13. 10 cts.
Guarantee Standard Pavements, Should Contractors be Required to? Is Not "Mill Inspection" of Paving Materials a Preferable Solution of the Problem? 3-4 p., Engineering-Contracting, April 20. 10 cts.
Assessing for Street Paving. 1-3 p., Municipal Journal & Engineer, April 27. 10 cts.
Sidewalks and Roadways, Improvement of both should be on the same basis. ½ p., Municipal Journal & Engineer, April 27. 10 cts.
Merchandise on Sidewalks. ½ p., Municipal Journal & Engineer, April 27. 10 cts.
Trees, Location of Street Shade. 3-4 p., Municipal Journal & Engineer, May 4. 10 cts.
Grade Crossings. Paper before St. Louis Railway Club. By H. J. Pfeiffer. 2 pp., Canadian Engineer, April 29. 15 cts.

SEWERAGE AND SANITATION

Sewerage, Llandrindod Wells. Illustrated. 2-3 p., Contractor Journal, April 6. 20 cts.
Calumet Drainage Problem. Address by G. M. Wisner, Chief Engineer of the Sanitary District of Chicago, before City Club. 5 pp., City Club Bulletin, April 6. 10 cts.
North Shore Channel of the Sanitary District of Chicago. Illustrated, 11-3 pp., Engineering-Contracting, April 27. 10 cts.
General Instruction Regarding the Construction of Sewers, their Discharge and the Purification of Effluents. Approved by the Superior Public Health Council of France in accordance with the report of Talmette and Masson. 7 pp., La Technique Sanitaire, March. 50 cts.
Construction of A Large Sewer in Chicago on Weston Avenue. Illustrated, 2 pp., Contractor, April 15. 20 cts.
Excavating Machinery in Sewer Work. 1-3 p., Municipal Journal & Engineer, May 4. 10 cts.
Cost of a Sewer at Muskoka, Ont. Illustrated, 1 p., Canadian Engineer, April 22. 15 cts.
Concrete Sewers in Louisville. Reasons which influenced the adoption of concrete for large sewers. ½ p., Municipal Journal & Engineer, April 27. 10 cts.
Constructing Concrete Sewers in Open Trench. Illustrated, 3-4 p., Engineering Record, April 16. 10 cts.
Experiments on the Cost and Durability of Cement Drain Tile. Paper before Canadian Cement and Concrete Association. By W. H. Day. 1 p., Engineering-Contracting, April 13. 10 cts.
Pumping Station at Elizabeth, N. J., Sewage. Electric motors automatically operated. Automatic protection from flooding. Structural details. Illustrated, 13-4 pp., Municipal Journal & Engineer, April 13. 10 cts.
Turbine Pump in the Low Level Pumping Station, Montreal, Que. Illustrated. 3½ pp., Canadian Engineer, April 8. 15 cts.
Manhole, Design for a Trap. By W. R. Worthington. Illustrated. 2-3 p., Canadian Engineer, April 22. 15 cts.
Sewer Maintenance in Washington. 1-4 p., Municipal Journal & Engineer, April 13. 10 cts.
Sewage and Sewage Effluents. Interpretation of the Results of Analyses. Paper before Association of Managers of Sewage Disposal Works. By J. C. Thresh. 2½ pp., Surveyor, April 1; 1½ pp., April 8. 20 cts.
Tannery Wastes in Sewage. 1 p., Canadian Engineer, April 15. 15 cts.
Interpretation of the Results of the Analyses of Sewage and Sewage Effluents. Paper before Association of Managers of Sewage Disposal Works. By J. C. Thresh. 5 pp., Water, April 15. 20 cts. 2 pp., Contractor Journal, March 30. 20 cts.
Sewage Disposal Ideals. Paper before Society of Engineers. By W. C. Easedale. 1½ pp., Canadian Engineer, April 8. 15 cts.
Notes on the Proposed Sewage Disposal Plant for Gloversville, N. Y. By Morrell Vrooman. ½ p., Engineering News, April 28. 15 cts.
Sewage Disposal at Birmingham and Salisbury, England. From papers before Institution of Civil Engineers. By J. D. Watson and by W. J. E. Binnie. 12-3 pp., Engineering Record, April 16. 10 cts.
Sewage Disposal Works at Indiana, Penn. Illustrated, 1½ pp., Engineering Record, April 30. 10 cts.
Practical Sewage and Sewage Disposal. By H. C. H. Shenton. Local Government Journal, April 2. 10 cts.
Septic Tank, Present Status of the. Paper before Union of Alberta Municipalities. By Prof. Muir Edwards. 2 pp., Western Municipal News, April. 10 cts.
The Question of Septic Tanks. 5 pp., La Technique Sanitaire, March. 50 cts.
Preliminary Processes of Sewage Disposal. By A. J. Martin. Illustrated, 11 pp., Journal Royal Institute of Public Health, April. 60 cts.
Biological Purification of Sewage, Some Considerations regarding the. The doctrines of Hampton and Hamburg. 3 pp., La Technique Sanitaire, April. 50 cts.
Sludge Problem, Sewage. Experience at Columbus, O., and elsewhere. ½ p., Municipal Journal & Engineer, April 20. 10 cts.
Statistics, Sewerage and Sewage Disposal, for Cities in France and Germany. ½ p., Engineering News, April 21. 15 cts.
Stream Pollution by the Birmingham Sewage Works. A Notable British Court Decision Regarding. 2 pp., Engineering News, April 21. 15 cts. 1-13 pp., Engineering Record, April 30. 10 cts.
Discharge of Sewage into the Hudson River. 1-3 p., Engineering News, April 28. 15 cts.
Health, Economic Aspect of. Paper before N. Carolina Society for the Study of the Prevention of Tuberculosis. By W. S. Rankin, Secretary State Board of Health, 7 pp., Bulletin N. Carolina Board of Health, March. 10 cts.
Hook-Worm Disease in a Public School in Richmond County, Va. Results of Microscopic Examination for. By C. W. Stiles. 1½ pp., Public Health Reports, April 22. 10 cts.
Typhoid Epidemic Characteristics. From paper before American Public Health Association. By J. F. Anderson. ½ p., Municipal Journal & Engineer, April 13. 10 cts.
Classification and Study of Typhoid Statistics of the Cities of the United States. By G. R. Taylor. 3 pp., Engineering News, April 21. 15 cts.
Germ in Butter and Milk. Life of Typhoid Bacteria. 1-4 p., Municipal Journal & Engineer, April 13. 10 cts.
Rat, Our Duel with the. Damage done and infection carried by them. Methods of extermination. By R. Austin Freeman. Illustrated, 12 pp., McClure's, May. 15 cts.
Cleanliness, Bake Shops versus. 1½ pp., Bulletin Indiana State Board of Health, February. 10 cts.
Clean-Up Day in Texas. Suggestions by the State Board of Health. 1-4 p., Municipal Journal & Engineer, April 13. 10 cts.

WATER SUPPLY

Water Supply in India. The Moulmein, Burma, Scheme. Paper before Society of Engineers. By P. G. Scott. Illustrated, 3 pp., Surveyor, April 8. 20 cts.

Contract Journal, April 1, 20 cts.

Minneapolis Water Supply, 1 p., Fire and Water, April 6. 10 cts.

New Water Supply for Grand Rapids. 1-3 p., Municipal Journal & Engineer, April 20. 10 cts.

Proposed Enlargement of the Water Supply of Baltimore, Md. By A. M. Quick. 1 p., Engineering News, April 21. 15 cts.

The Hetch-Hetchy Project. 2-3 p., Fire and Water, April 6. 10 cts.

Mille Lac Survey, Minnesota. Methods and Costs. By Robt. Follansbee. Illustrated, 1 p., Engineering News, April 7. 15 cts.

Water Resources Investigation in Minnesota. By Robt. Follansbee. 8 pp., Cornell Civil Engineer, April. 20 cts.

Water Supplies Protection Bill. 1½ pp., Water, April 15. 20 cts.

Shallow Wells for Municipal Water Supply. Results of Experiments on Pollution in. From paper before Illinois Water Supply Association. By C. D. Burdick. 1 p., Engineering-Contracting, April 27. 10 cts.

1 p., Engineering News, April 21. 15 cts.

Stream Discharges. Comparison of, Indicated by Current Meter and by Weir Formulas. Yakima River, Washington. By J. C. Stevens. Illustrated, 1 p., Engineering News, April 28. 15 cts.

Seepage Losses from Streams in Owens Valley, Cal. By C. H. Lee. Illustrated, 2½ pp., Engineering News, April 21. 15 cts.

The Hume Lake Multiple Arch Dam. 23 pp., California Journal of Technology, March. 15 cts.

Crib, New Method of Placing Cast Iron Rail in Water Works. Illustrated, 4 pp., Engineering-Contracting, April 13. 10 cts.

Reservoir, Skating Rink on a. Rink for roller and ice skating on top of covered reservoir at Reading, Pa. Construction details. Illustrated, 1½ pp., Municipal Journal & Engineer, May 4. 10 cts.

Failure of a Reinforced Concrete Reservoir at Mittagong, New South Wales. 3-4 p., Engineering Record, April 23. 10 cts.

An Earth Reservoir at Ogden, Utah. 1 p., Engineering Record, April 16. 10 cts.

Groined Arch in Filter and Covered Reservoir Construction. From paper before National Association of Cement Users. By T. H. Wiggin. Illustrated, 8 pp., Engineering-Contracting, April 6. 10 cts.

Illustrated, 5½ pp., Engineering News, April 7. 15 cts.

Reconnaissance Method of Determining the Volume of Reservoir Sites. By H. W. Sheley. Illustrated, 4 pp., Engineering Record, April 30. 10 cts.

Aqueduct Costs, Some Los Angeles. 1 p., Engineering News, April 28. 15 cts.

Core Drilling Under the Hudson River for the Catskill Aqueduct. By W. E. Swift, Division Engineer, Board of Water Supply. 1 p., Engineering News, April 7. 15 cts.

Richmond Concrete Conduit. New reinforced concrete to replace one which failed. Removing old pipe by blasting. By J. A. Johnston. Illustrated, 2 pp., Municipal Journal & Engineer, April 20. 10 cts.

Pumping Engines, Duty of. Communication from C. A. Hague. 1-3 p., Engineering News, April 28. 15 cts.

High Duty Record for a Pumping Engine at Atlanta, Ga. 1-3 p., Engineering News, April 7. 15 cts.

Test of High-Duty Pumping Engine at the Philadelphia Water Works Pumping Station. Lardner's Point, Frankfort, Pa. 1-3 p., Engineering News, April 7. 15 cts.

Design, Construction and Operation of High-Lift Centrifugal Pumps. By Frank zur Nedden. Illustrated, 6 pp., Engineering Magazine, May. 25 cts.

Compressed Air Water Works System, Yorkton. By F. T. McArthur. Illustrated, 1½ pp., Canadian Engineer, April 15. 15 cts.

Water Purification and Pumping Plant at New Orleans, La. Illustrated, 5 pp., Engineering Record, April 23. 10 cts.

Water Purification at Columbus. Plant of 30,000,000 gallons capacity. Water softening using lime and soda ash. Coagulation by use of sulphates of alumina and iron. Rapid sand filters. Illustrated, 4 pp., Municipal Journal & Engineer, May 4. 10 cts.

Sand Filters and Disease Germs. Passage of pathogenic bacteria. May actually increase within them. Removal due to surface attraction. By Rudolph Hering. 1½ pp., Municipal Journal & Engineer, April 27. 10 cts.

1½ pp., Engineering Record, April 30. 10 cts.

Engineering News, April 28. 15 cts.

Filters and Bacillides. 1-4 p., Municipal Journal & Engineer, May 4. 10 cts.

Reading Water Works Improvement. Two sand filtration plants. Concrete arch

and flat roofs. Producer Gas pumping plant. Illustrated, 7½ pp., Municipal Journal & Engineer, April 20. 10 cts.

Some English Costs of Washing Filtering Material, Using a Special Washing Machine. From paper before Institute of Sanitary Engineers. By A. B. Ogden. 2-3 p., Engineering-Contracting, April 27. 10 cts.

Coagulating Plant of the St. Louis Water Works. By A. I. Jacobs. 15 pp., Journal Association of Engineering Societies, March. 30 cts.

Sterilization of Water. By Waldon and Powell. 4½ pp., Municipal Engineering, May. 25 cts.

Disinfection of Toronto's Water Supply. 1 p., Canadian Engineer, April 8. 15 cts.

Bleaching Powder Sterilization. Methods and results of its use at Ridgewood, Midland Park, Boonton and Little Falls, N. J., Newport, R. I., Omaha, Neb. and Montreal, Can. Illustrated, 2 pp., Municipal Journal & Engineer, April 20. 10 cts.

Disinfecting Water Supply. Comment on Use of Bleaching Powder and Ozone. ½ p., Municipal Journal & Engineer, April 20. 10 cts.

Use of Hypochlorite of Lime to Disinfect the Water Supply of Montreal. Illustrated, 1 p., Engineering News, April 7. 15 cts.

Use of Sulphate of Alumina and Hypochlorite of Lime in the Storage and Distributing Reservoir of the Nashville Water Works. By Geo. Reyer. Illustrated, 2 pp., Engineering News, April 7. 15 cts.

Experiments with Hypochlorite of Lime as a Water Disinfectant at Hartford, Conn. By E. M. Peck. ½ p., Engineering News, April 7. 15 cts.

Hypochlorite of Lime as an Adjunct to Mechanical Water Filtration at Quincy, Ill. Paper before Illinois Water Supply Association. By W. R. Gelston. ½ p., Engineering News, April 7. 15 cts.

Use of Hypochlorite of Lime in Connection with the Mechanical Filtration Plant of Harrisburg, Pa. 1 p., Engineering News, April 7. 15 cts.

The Digby-Shenton Method of Producing Electrolytic Chlorine. 1 p., Canadian Engineer, April 22. 15 cts.

Growing Use of Hypochlorites of Sodium and Calcium as Water Disinfectants. 11-13 pp., Engineering News, April 7. 15 cts.

Ozone Sterilization of Water. Different forms of Apparatus used. Principles of action. Effects of temperature and humidity. Experiments in France and America. Cost of 2½ million gallon plant. By C. D. Meeker. Illustrated, 7 pp., Municipal Journal & Engineer, April 20. 10 cts.

Production and Utilization of Ozone, with Special Reference to Water Purification. Illustrated, 8 pp., Engineering News, April 28. 15 cts.

Commercial Utilization of Ozone for Water Purification and Other Purposes. 1½ pp., Engineering News, April 28. 15 cts.

Water Softener, A German. Permutit. 1-3 p., Municipal Journal & Engineer, April 13. 10 cts.

Statistics of Water Works Plant, in Cities of more than 30,000 population. 4 pp., Municipal Journal & Engineer, April 20. 10 cts.

Municipal Water Works Plants in 74 per cent of all cities of over 30,000 population. Spacing of fire hydrants. Hydrant rental. Finances of departments. 1 p., Municipal Journal & Engineer, April 20. 10 cts.

Statistics of Water Supply in French Speaking Cities of over 5,000 population. ½ p., Engineering News, April 21. 15 cts.

Meters in Service, Care and Maintenance of. Paper before American Water Works Association. By A. W. Cuddeback. Illustrated, 3 pp., Fire and Water, April 27. 10 cts.

Operation, Tendencies in Water Works. Paper before Indiana Sanitary and Water Supply Association. By Leonard Metcalf. 2 pp., Water and Gas Review, April. 20 cts.

Going Value of Water Works. The Antigo Water Company case before the Railroad Commission of Wisconsin. 1 p., Engineering Record, April 23. 10 cts.

Water District, A Massachusetts. ½ p., Municipal Journal & Engineer, May 4. 10 cts.

Decision, The Ripon Water Works. 2 pp., Engineering Record, April 30. 10 cts.

GOVERNMENT AND FINANCE

Government, The New American City. A favorable analysis of the Des Moines plan. By George Kibbe Turner. 12 pp., McClure's, May. 15 cts.

Civic Development in Oklahoma and Texas. By H. E. Weed. 2 pp., The American City, April. 10 cts.

Public Utility Law, New Jersey. Full text. ½ p., Progressive Age, May 2. 20 cts.

Public Service Commission Law, Discus-

sion of. 1½ pp., Electric Railway Journal, April 9. 10 cts.

Graft in Pittsburg. The Shame of a Great City Exposed. By C. R. Lindner. 11-13 pp., Leslie's Weekly, April 21. 10 cts.

Tax Account, Treatment of the. By F. L. Hutchins. 3 pp., Journal of Accountancy, April. 25 cts.

Depreciation and Reserve Funds. Paper before Western Society of Engineers. By W. B. Jackson. 1½ pp., Engineering Record, April 30. 10 cts.

Economy in Municipal Expenditures. Suggestions by Geo. Cromwell, President of the Borough of Richmond. ½ p., Municipal Journal & Engineer, April 13. 10 cts.

Contractual Responsibility, Obligation and Liquidation. By W. M. Williams. 2½ pp., American City, April. 10 cts.

STREET CLEANING AND REFUSE DISPOSAL

Town Scavenging and Refuse Disposal. By H. S. Watson. Illustrated, 4 pp., Municipal Engineering, May. 25 cts.

Collection and Disposal of House Refuse at Plymouth. Paper before Royal Sanitary Institute. By James Paton. ½ p., Contract Journal, April 13. 20 cts.

Methods of Refuse Collection and Disposal in Boston, Mass. 2-3 p., Engineering-Contracting, April 6. 10 cts.

Refuse Disposal in Milwaukee. Methods and plants used during the past thirty years. Report of Rudolph Hering. Plans contemplated for using surplus steam power. Detailed description of plant. Handling of refuse. Ventilation. By Fred S. Sly. Illustrated, 8 pp., Municipal Journal & Engineer, May 4. 10 cts.

St. Louis Garbage Reduction Plant. ½ p., Municipal Journal & Engineer, April 27. 10 cts.

Disposal of the City's Waste. By W. F. Morse. Illustrated, 4 pp., American City, April; 4 pp., May. 10 cts.

TRAFFIC AND TRANSPORTATION

Traffic Conditions Influencing Passenger Subway Construction in Chicago. Illustrated, 3½ pp., Engineering-Contracting, April 20. 10 cts.

Receipts, Percentage of, as Compensation for Street Railway Franchises. 3 pp., Municipal Engineering, May. 25 cts.

Recent No-Seat-No-Fare Ordinance. 3-4 p., Electric Railway Journal, April 16. 10 cts.

Subway, The "Elephant," London. Illustrated, 1 p., Contract Journal, March 30. 20 cts.

Cost of the New York Subway and of Operating It. 11-13 pp., Engineering-Contracting, April 13. 10 cts.

Construction for Interurbans, Permanent City Track. Paper before Central Electric Railway Association. By H. L. Weber. Illustrated, 1½ pp., Electric Railway Journal, March 26. 10 cts.

Method of Reconstructing the Washington Street Tunnel of the Chicago Railway. Illustrated, 4 pp., Engineering-Contracting, Company. A new and economical method. April 20. 10 cts.

BRIDGES AND STRUCTURAL MATERIALS

Cement, Properties of German Portland. By Clifford Richardson. 2 pp., Cement Age, April. 15 cts.

Prices, Current, of Materials, Supplies and Small Tools Used in Construction Work. 5½ pp., Engineering-Contracting, April 6. 10 cts.

Testing Laboratories, Notes on some European. 1 p., Engineering News, April 28. 15 cts.

Sand of One Size, The Influence of, on the Quantity of Sand of Another Size That a Stream Will Transport. By E. C. Murphy. Illustrated, 4 pp., The Cornell Civil Engineer, April. 20 cts.

Concrete Bridge Failures, Analysis of. Paper before Canadian Cement and Concrete Association. By C. I. Young. Illustrated, 3½ pp., Engineering-Contracting, April 13. 10 cts.

Illustrated, 2 pp., Engineering Record, April 16. 10 cts.

A Three-Hinged Reinforced Concrete Arch Viaduct. Illustrated, 3 pp., Engineering Record, April 30. 10 cts.

Building a Concrete Bridge from an Existing Structure at Bethlehem, Pa. Illustrated, 2 pp., Engineering Record, April 23. 10 cts.

Foundations in Chicago. By W. C. Armstrong. Illustrated, 7 pp., Iowa Engineer, April. 20 cts.

Forms of Concrete Pile Construction and a Statement of the Advantages and Disad-

vantages of Concrete Piles. 1 p., Engineering-Contracting, April 20. 10 cts.
Waterproofing Structures, Methods of Illustrated, 2 pp., Engineering-Contracting, April 13. 10 cts.
Corrosion of Metals by Water, Concerning the. By G. W. Fuller. 2 pp., Engineering Record, April 23. 10 cts.

MISCELLANEOUS

Fire Hose, New Specifications for. Adopted by New York Fire Department. 1½ pp., Municipal Journal and Engineer, May 4. 10 cts.
 A Ladder that Will not Split. Illustrated, 1 p., Fireman's Herald, April 23. 5 cts.
 Cost of Fire Protection, Twenty per cent of Total Cost of Water Works Systems. Hydrants, Water supply, High pressure systems. 1½ pp., Municipal Journal and Engineer, May 4. 10 cts.
Markets in Buffalo and Charleston. 1-3 p., Municipal Journal and Engineer, May 4. 10 cts.
 Municipal Markets of St. Louis. Three municipally operated markets. Outside stalls better patronized than interior of building. Structural features. Sanitation and refrigeration. Methods of renting and prices obtained. Financial aspect. By C. C. Casey. Illustrated, 5 pp., Municipal Journal and Engineer, April 27. 10 cts.
 Municipal Market Building. ¼ p., Municipal Journal and Engineer, April 27. 10 cts.
Abattoir at De Soussons, The Modern. By J. de Loverdo. Illustrated, 11 pp., La Technique Sanitaire, April. 50 cts.
Baths at Hincley, New Public. Details of construction. Illustrated, 2 pp., Surveyor, April 1. 20 cts.
Museum, The Welsh, Cardiff. Illustrated, 1 p., Municipal Journal, April 1. 15 cts.
Theatre of Denver, Municipal. Illustrated, 2 pp., American City, May. 10 cts.
Municipal Work Done by Day Labor and by Contract, Relative Cost of. By H. P. Eddy. 3 pp., Canadian Engineer, April 8. 15 cts.
 Inspection of Public Works. Oversight of San Francisco Municipal Contract by Merchants' Association. ¼ p., Municipal Journal and Engineer, April 13. 10 cts.
 Relative Efficiency of the Day Labor and Contract System of Doing Municipal Work. Discussion of papers by H. P. Eddy before the Boston Society of Engineers. By C. R. Gow and others. 11-3 p., Engineering News, April 28. 15 cts.
Expenditures, System in Park. How the Utica, N. Y., Park Board keeps its accounts. Forms used. Methods of preventing fraud. Classifying accounts to prevent waste. Description of park system and playgrounds. By Arthur C. Comey, Supt. of Parks. Illustrated, 4½ pp., Municipal Journal and Engineer, April 13. 10 cts.
Pipe Gallery, New York City. Just completed in Delancey Street in connection with subway. Method of construction. Obstacles. By W. G. Turinl. Illustrated, 1¼ pp., Municipal Journal and Engineer, April 13. 10 cts.
 Galleries for Sub-Surface Pipes. Probable cost in small city. ¼ p., Municipal Journal and Engineer, April 13. 10 cts.
Thawing Small Pipe Culverts. Illustrated, ¼ p., Municipal Journal and Engineer, April 13. 10 cts.
Harbor Problem, Some Views on the Chicago. 1 p., Engineering News, April 28. 15 cts.
 New Dock Facilities at Avonmouth, England. Illustrated, 2 pp., Engineering News, April 28. 15 cts.
Light and Illumination, The Measurement of. Discussion before Illuminating Engineering Society. 1 p., Contract Journal, April 20. 20 cts.
 Rates for Tungsten Lamps. By A. D. Adams. 3 pp., Municipal Engineering, May. 25 cts.
 Closing Books for Fiscal Year of Electrical and Gas Corporations. By W. A. Clader. 7 pp., Journal of Accountancy, April. 25 cts.
Electricity Station, Dundee. Illustrated, 2 pp., Municipal Journal, April 8. 15 cts.
 Underground Electrical Distribution. By W. E. Hazeltine. 4½ pp., General Electric Review, May. 20 cts.
Civil Engineers, Licensing. ¼ p., Municipal Journal and Engineer, April 27. 10 cts.
 The Engineer as an Expert Witness. By W. G. Raymond. 7 pp., Iowa Engineer, April. 20 cts.
Surveying, The Stadia and Stadia. By E. M. Douglas. Illustrated, 2 pp., Engineering News, April 28. 15 cts.
 Tests of Simple and Inexpensive Surveying Instruments. Paper before Illinois Society of Engineers and Surveyors. By J. T. Stewart. 11-3 pp., Engineering News, April 21. 15 cts.
 Estimating Cost of Surveys. By J. J. Amos. 1¼ pp., Surveyor, April 1. 20 cts.

Description, Popular. "The Perfect Village of Finistere." By Mary Denver Hoffman. Illustrated, 7 pp., The Outlook, April 23. 10 cts.
 Los Angeles in the Making. By J. W. Mitchell. Illustrated, 9 pp., The American City, April. 10 cts.
 Development of Denver. By C. M. Robinson. Illustrated, 10 pp., American City, May. 10 cts.
 Lichfield and Some of Its Municipal Works. Paper before Association of Municipal and County Engineers. By W. B. Chancellor. 1 p., Contract Journal, April 20. 20 cts.
Paris Flood. Five full-page illustrations. By A. Castaigne. The Century, May. 35 cts.
Housing in Hereford. Activity in administering the Housing Act. Illustrated, 1½ pp., Municipal Journal, April 22. 15 cts.
 Congestion in New York City. High land values its cause. ¼ p., Municipal Journal and Engineer, April 13. 10 cts.
Playground Association in a Great City, Task of a. By Howard Bradstreet. 6 pp., Playground, April. 25 cts.
City Building in Germany. Government regulation, scientific study. Semi-popular discussion. By Frederic C. Howe. Illustrated, 13½ pp., Scribner's, May. 25 cts.
 Limits of City Beautification. By F. L. Olmsted. 3 pp., American City, May. 10 cts.
 City Beautiful the Ideal to Aim at. By Loring Underwood. Illustrated, 5 pp., American City, May. 10 cts.
Reform. "The Beast and the Jungle." Final chapter and summary of his fight against the "system." By Judge Ben B. Lindsey. 13 pp., Everybody's, May. 15 cts.
Independence Day, Suggestions for Celebrating. By A. H. Brunner. Illustrated, 19 pp., Playground, April. 25 cts.
Census Bureau Criticism. ¼ p., Municipal Journal and Engineer, May 4. 10 cts.
Conventions, Exhibits at. ¼ p., Municipal Journal and Engineer, May. 10 cts.
Fuels, Low-Grade. 1-3 p., Municipal Journal and Engineer, April 20. 10 cts.
Power Proposition, Analysis of Water. By E. J. Bugler. 12 pp., Journal Association of Engineering Societies, Mar. 30 cts.
 English Practice in Condensing Equipment. By J. A. Seager. Illustrated, 5 pp., Power, April 19. 5 cts.
Trades, The Economic Value of Motion Study in Standardizing the. By F. B. Gilbreth. Illustrated, 4 pp., Industrial Engineering, April. 20 cts.

INCORPORATIONS

Carden-Kerwin Co., Chicago, Ill.; engineering and construction work; capital, \$15,000. Parker H. Hoag, Frederick Ullman, Jr., A. E. Goodman. Ullman & Hoag, Fisher Bldg., Chicago, Ill.
Cunningham-Woodard Co., Hudson Falls, Washington County, N. Y.; general contractors, roads, railroads, bridges, water works, etc.; capital, \$10,000. Incorporators: John J. Cunningham, Hudson Falls, Wash. Co., N. Y.; Alan J. Woodard, Whitehall, N. Y.; Edward J. Cunningham, Hudson Falls, N. Y.
International Elevated Railway Co.; Chas. Guyer, Wilmington, Del.; capital, \$50,000.00. Incorporators: George C. Schroeder, Washington, D. C.; Chas. G. Guyer, S. E. Becker, both of Wilmington, Del.
MacArthur Concrete Pile & Foundation Company, New York City; Corporation Trust Company of America; capital, \$25,000. Incorporators: Arthur F. MacArthur, John R. MacArthur, Hunley, Abbott, all of New York City.
The Mississippi River Power Co., Delaware Trust Co.; capital, \$3,000,000. Incorporators: John J. Loughlin, Brooklyn, N. Y.; J. F. Carroll, Manhattan, N. Y.; Harry W. Davis, Wilmington, Del.
Rider Construction Company, Monticello, Sullivan County, N. Y.; collect and dispose of garbage, ashes, etc.; general contracting and construction business; capital, \$10,000. Incorporators: T. Chauncey Rider, Alexander Thompson, both of Monticello, N. Y.; Edward A. Robinson, 618 S. 8th Avenue, Mt. Vernon, N. Y.
Rosslyn Clay Material Co., Inc., Rosslyn, Va.; to manufacture clay products; capital, \$15,000. Incorporators: W. L. Jackson, president; Charles Walden, vice-president; Edwin Smith, secretary, all of Rosslyn.
Standard Gas & Electric Co., Philadelphia, Pa.; to manufacture and generate gas and electricity for light, heating and power; capital, \$24,000,000. Incorporators: Edgar E. McWhittry and Joseph P. Murray.
Southern New York Power Co., New York; furnish electricity for light, heat and power, etc.; capital, \$50,000. Incorporators: Albert H. Sewell, Walton, N. Y.; Roy C. Megarell, New York, and Carleton A. Graves, Brooklyn.

BOOK REVIEWS

Town Planning in Practice. An Introduction to the Art of Designing Cities and Suburbs. By Raymond Unwin. Imported by Charles Scribner's Sons. Cloth, 8 by 10 inches, 415 pp. Illustrated, 7 maps. Price \$6.

The material of this book including many valuable illustrations was collected by the author during some years of study and practice in the art of town planning. The Parliamentary bill conferring town planning powers on municipal bodies was the immediate cause for the publication. The author at the start wishes to impress on the reader the fact that civic art is the expression of civic life. The movement towards town improvement of which town planning forms but one branch must have for its aim the creation of such a city as shall at once express the common life and stimulate its inhabitants in their pursuit of that end. A mining town and a fishing village cannot be built on the same plan. Concrete examples are given of the individuality of towns, in connection with which a slight sketch is given of the ancient art of town planning. Very definite ideas of town planning were entertained centuries before the Christian era. Selinus, a Greek colony founded 628 B.C., is a case in point. The individuality of modern instances of town planning is gone into extensively and photographs and maps of cities from many countries illustrate the meaning. Instances of formal and informal beauty are pointed out and the leaning of the author toward the latter system is evident. A thorough survey is the first requisite in the formation of a plan in order that the planner may study his site, the people, and their requirements. Boundaries and approaches are a distinct subdivision of town planning and must be treated in accordance with pre-existing conditions. Centers and enclosed places are given a chapter. The importance of the center in an ancient town before the days of printing, when the market place was the only place for intercommunication of the inhabitants, is explained. Coming to the subject of roads, their two functions are noted. Primarily they are highways for traffic. They afford also a secondary purpose as affording sites for buildings. The arrangement of main roads, their treatment and planting is given an extended discussion. Examples are given of the common trellis plan and the advantages of web-shaped or special irregular systems are illustrated. Site planning and residential roads are treated separately because while the main principles that govern one apply to the other, there is this difference that the first consideration is the arrangement of buildings while in town planning the first consideration is the general convenience of the town. The suburbs of English and German plans afford interesting illustrations of different methods of treatment. In deciding upon plots and the spacing and placing of buildings and fences, it is first necessary to decide upon the approximate number of houses which are to be built to the acre. Some very satisfactory definite conclusions have been worked out in connection with this subject. The author emphasizes the fact that the variety of buildings and sites should be so worked out that each must be dominated by the harmony of the whole. The advantages of cooperation in site-planning are pointed out and it is shown how common enjoyment benefits the individual. The final chapter treats of building by-laws as they are and as they should be. The reader of this book may be disappointed to find that town planning is, as the author says, at the beginning, an art and if he is a practical man engaged in city work, he will probably wish it were a science. The author's subdivision of the subject may indicate the main branches of a future science of town planning. But in the detailed treatment of the topics, few definite general principles are apparent. The many illustrations, however, offer many suggestions that will aid the town planner in his work.

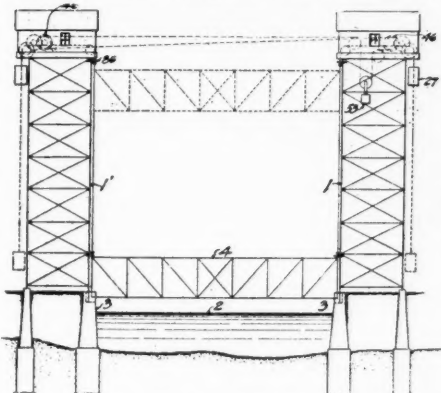
Intercommunicating System Instruction Book. The Dean Electric Company, Elyria, O. Flexible cloth, 4 by 6½ inches. Illustrated, 111 pp. Price \$50.

This volume is a handbook made in convenient form for carrying in the pocket for the use of electricians in installing intercommunicating systems. In preparing the instructions, the descriptions have been made general so as to be useful to a person installing any make of apparatus. Some of the detail operations require that a particular equipment should be described. In such cases the Dean Intercommunicating Apparatus is referred to. The book is a thoroughly practical one, the frequent use of diagrams aiding to make the descriptions clear.

PATENT CLAIMS

953,307. **LIFT-BRIDGE.** John A. L. Wadell and John L. Harrington, Kansas City, Mo. Serial No. 440,463.

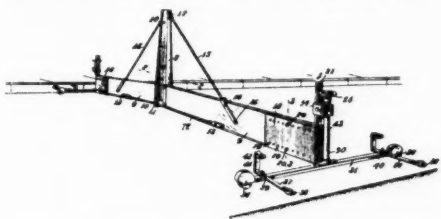
A lift-bridge comprising towers, motor mechanism mounted upon the top of each tower, each mechanism comprising a motor-shaft, a motor coupled to the motor-shaft,



an intermediate lift-span, gearing geared with the motor-shaft, and flexible connections between the ends of the lift-span and the gearing.

953,490. **STREET GAGE.** Patrick Roughe, Fond du Lac, Wis. Serial No. 500,455.

A street gage, comprising truck members mounted upon wheels adapted to be moved lengthwise of the street and at either side thereof, forms hinged con-



nected to each other adapted to extend across the said street and to be connected with said truck members, and adjustable connections for said hinged members to said truck members, for regulating the height of the said hinged members.

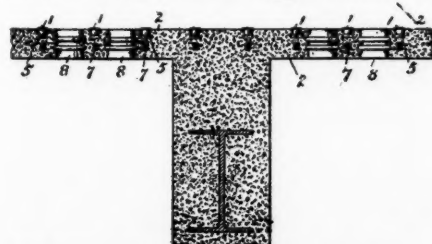
954,267. **CURB-JOINT.** Napoleon Dubuc, Jr., Milford, N. H., assignor of one-half to Edward L. Kittredge, Milford, N. H. Serial No. 521,034.

In combination with angularly disposed slabs, fastenings having their outer ends secured in the slabs near the angle and having their inner ends bent and extending across the angle formed between the slabs and terminating in eyes and means connecting the inner ends of the fastenings and

passed through the eyes thereof.

954,966. **TREAD-SURFACE FOR PAVEMENTS AND THE LIKE.** Charles B. Jacobus, Port Chester, N. Y., assignor to Murray and Jacobs Manufacturing Company, New York, N. Y., a corporation of New York. Serial No. 520,503.

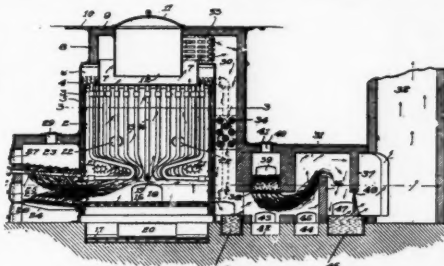
A tread comprising a base of cast metal and a layer of granular hard mineral elements embedded in the upper surface of



said base, said elements being of such material and size that they will not be injured by the heat of the molten metal when casting the base and part at least of said elements being partly exposed to prevent slipping and to protect the metal in which they are embedded from abrasion.

954,855. **GARBAGE EVAPORATOR AND CREMATORY.** Felix L. Decarie, Minneapolis, Minn., assignor by mesne assignments, to Decarie Incinerator Company. Serial No. 294,179.

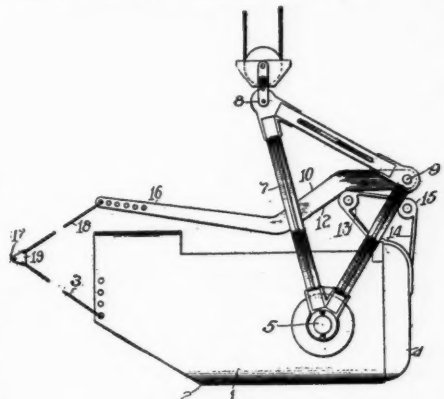
In a garbage crematory having a combustion chamber, the combination, with a fire grate, of a garbage basket arranged in the combustion chamber over said grate and composed of upright members having



their lower portions extended inwardly to form the bottom of the basket, said members and their inwardly extending portions being spaced apart for the passage of flames from the fire grate, and the inwardly extending portions at their inner ends being so disposed in relation to each other as to form a discharge opening in the bottom of the basket.

954,318. **EXCAVATOR-BUCKET.** Oscar J. Martinson, Chicago, Ill., assignor to Monighan Machine Company, Chicago, Ill., a corporation of Illinois. Serial No. 533,738.

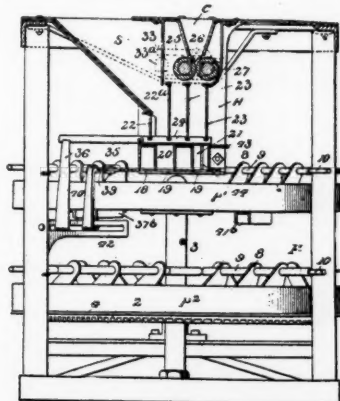
In an excavator, the combination of a bucket pivoted at a point back of its center of gravity, a hauling cable operatively



connected to the front of said bucket, hoisting means for lifting said bucket, and a lever connected with said hauling cable and operatively interposed between said bucket and hoisting means for controlling the tilting of said bucket in said frame.

953,961. **CONCRETE-MIXING MACHINE.** Charles F. Lancaster, Petoskey, Mich. Serial No. 477,312.

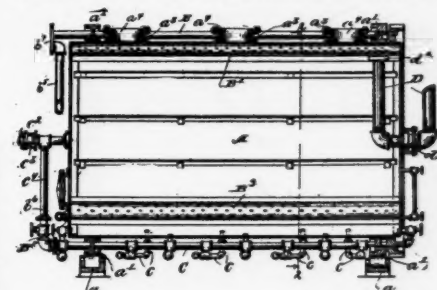
In a concrete mixing machine, the combination of a rotatable pan, a framework in which said pan is mounted, means for rotating the pan, and mixing blades in a plurality of substantially radially extending



series mounted on said framework, each of said blades being independently pivoted for free vertical movement, said blades being laterally twisted and extending downward at an inclination to the bottom of the pan in a direction reverse to the direction of movement of the pan.

954,582. **PERCOLATOR.** Ernest S. Peck, Cleveland, O. Serial No. 509,017.

A percolator comprising a suitable receptacle provided with openings for the supply and discharge of the material to be treated; connections to said receptacle for introduc-



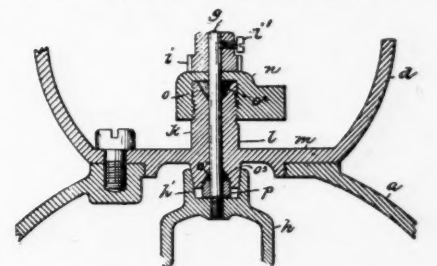
ing the solvent, said connections lying below the normal level of the material in said receptacle; other connections, substantially on a line with such level, for withdrawing the upper stratum of the solvent when thus introduced; and means for reversing the positions of said connections with relation to said level.

955,779. **COLLAPSIBLE AND ADJUSTABLE MOLD FOR CEMENT CULVERTS.** George W. Fish, Central City, Iowa. Serial No. 456,783.

A culvert mold including an approximately cylindrical collapsible section adjustable to vary the diameter of the mold and consisting of a continuous piece of sheet metal having overlapped longitudinal portions, one of the portions being provided with sets of longitudinal slots, a longitudinal bar secured to the inner face of the other overlapped portion at the edge thereof and provided with loops arranged to project through the said slots, and a removable interiorly arranged key passing through the loops and detachably securing the overlapped portions together.

954,621. **STUFFING-BOX FOR WATER-METERS.** Ernest E. Gamon, Newark, N. J. Serial No. 504,641.

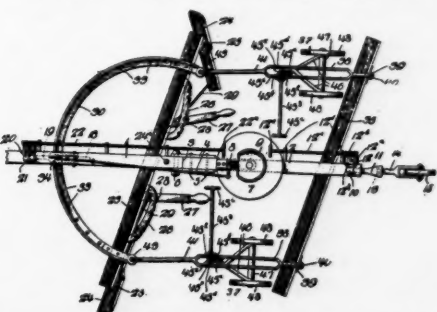
The combination with the casing of the register chamber of a meter providing a partition for separating the meter chamber and the register chamber, and provided with a stuffing box consisting of an upper post and a lower integral tapered post ex-



tending into said chambers respectively from said partition, of one of the driven parts of the meter provided with a tapered bearing arranged to surround the lower tapered post, a spindle passing through the said posts and connected with said driven part and packing parts located in the upper and lower posts and surrounding the spindle.

954,386. **ROAD-GRADER.** Adam Ganser, Lodi, Wis. Serial No. 508,007.

A grading machine of the class described having a frame, scraper elements pivotally connected thereto, vertically adjustable



supporting elements for the frame and vertically adjustable supporting elements for the ends of the scraper elements, the last named vertically adjustable supporting elements being disposed between and connected to the said scraper elements.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Street Railways—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

STREET IMPROVEMENTS

Berkeley, Cal.—Council has decided to widen Claremont ave.

Los Angeles, Cal.—Highway Commission has plans under way for improvement of San Fernando road, Newhall Pass and Fremont Pass.

Los Angeles, Cal.—Daniel S. Halladay, Engineer to Good Roads Advisory Committee, has been engaged by Orange County to outline good roads project.

San Diego, Cal.—Board of Supervisors has accepted plans for improving 77 miles of roads, from San Diego to Imperial County line.

Sisson, Cal.—Siskiyou County Board of Supervisors will build road to snow line on Mount Shasta from this city.

Pueblo, Col.—Council has ordered bids advertised for new sidewalks and sidewalk repairs.

Trinidad, Col.—Council has passed ordinance for paving of Cedar st.; paving of Animas st. is being considered.—I. Q. Milliken, City Clerk.

Middletown, Conn.—Extension of Good-year ave. is being considered.

New Castle, Del.—Committee, L. E. Ellason, Chairman, will take up matter of paved streets.

Wilmington, Del.—Ninth Ward residents are urging street improvements.

Arcadia, Fla.—Citizens have voted \$5,000 street improvement bonds.

Jacksonville, Fla.—Duval County Commissioners have ordered plans and estimates for approximately 10 miles of vit. brick paving.

Key West, Fla.—Hazelhurst & Anderson, Atlanta, Ga., will draw plans for proposed paving.

Albion, Ill.—City is considering street improvements, at cost of \$90,000.

Aurora, Ill.—City will pave North ave. with asphalt at cost of \$20,536; also State st., at \$17,361.

Chicago, Ill.—Council is considering widening and improving of 12th st.

Decatur, Ill.—Board of Local Improvements has decided to pave and improve W. Eldorado st.; cost \$3,000.

Joliet, Ill.—Mayor Cronin has signed ordinance for improvement of York ave. and Washington st.

Murphysboro, Ill.—City is considering brick paving on three streets.—George Kennedy, City Engineer.

Naperville, Ill.—Council has decided to oil macadam streets on east side, at total cost of \$9,300.

Hammond, Ind.—City Engineer Lyons will prepare plans and specifications for a 5-ft. sidewalk on Heuhn ave.

Indianapolis, Ind.—Board of Works has confirmed four street improvement resolutions.

Newcastle, Ind.—Petition has been filed with County Commissioners, asking that New York ave. be opened a distance of half a mile.

Princeton, Ind.—City is considering improvement of streets; brick or asphalt will be used. Address Mayor Davison.

Richmond, Ind.—Council has passed on first reading ordinance providing for improvement of N. 5th st.

Vincennes, Ind.—Cost of improving Indiana ave. has been estimated at \$2,134.20.

Centerville, Ia.—Bids for 25,930 yds. brick paving and 20,910 ft. combined curb and gutter have been rejected; new bids will be received until 2 p. m., May 13.—Hall & Adams, City Engineers.

Chariton, Ia.—City Engineer W. F. Frost has prepared plans for twelve blocks of brick paving.

Council Bluffs, Ia.—City proposes to expend \$150,000 this year in street and sewer improvements.

Leavenworth, Kan.—Cost of regrading and paving 7th st. has been estimated at \$1,828.42.

Wichita, Kan.—Bids will soon be received for 15 blocks of bitulthic paving.—William Sence, City Clerk.

Lexington, Ky.—Joint Improvement Committee is considering improving of portion of eight streets with brick and sixteen streets with macadam.

Louisville, Ky.—Park Board will ask city to ratify \$1,000,000 bond issue for completion of grand parkway connecting parks of city and for general improvement of parks.

Leesville, La.—Ward 1, Vernon Parish, has voted tax for road and bridge construction.

Baltimore, Md.—Contract will soon be let for construction of 5½ miles of State road between Gaithersburg and Darnestown; cost \$46,000.—M. D. Knight, Montgomery County Road Engineer.

Baltimore, Md.—State Roads Commission has considered plans for new roads in Allegany, Garrett and Frederick counties, and specifications will be advertised. at once; is also preparing for survey of boulevard between Baltimore and Annapolis.

Baltimore, Md.—Repaving of Chester and paving of Presbury sts. is being considered; Highway Committee has reported favorably on ordinance for paving two streets.

Berlin, Md.—Town has decided to expend \$15,000 in improving streets and water works.

Betterton, Md.—Citizens have voted \$2,000 bonds to build sidewalks.

Boston, Mass.—Council has authorized \$300,000 loan for laying out and constructing highway; Street Commissioners have approved proposed Arlington st. extension, expense to be borne by Park Square Real Estate Trust.

Boston, Mass.—Council has authorized \$10,000 for filling and grading Neponset playground; \$75,000 appropriation for band stand on Common.

Hagerstown, Md.—Macadamizing of West Side ave. is being considered.

Haverhill, Mass.—Council will spend about \$19,000 on permanent street improvements.

Lynn, Mass.—Mayor Rich is in favor of expending as much money as can possibly be provided for granolithic sidewalks.

Springfield, Mass.—Paving of Ferry st., material not yet decided, is being considered; cost about \$9,000.—M. Slocum, City Engineer.

Cheboygan, Mich.—Dr. J. McKay, Coleman, is advocating construction of stone road from this city to Ritters.

Detroit, Mich.—Council has decided to pave Hillger ave. with cedar blocks, cost \$5,363, and Calvert ave. with sheet asphalt, cost \$7,900.

Highland Park, Mich.—Citizens have voted to issue \$89,000 bonds for repairing Woodward ave.

Saginaw, Mich.—City Engineer R. W. Roberts has submitted plans and specifications to Board of Public Works for repaving, recurling and relaying sidewalks and lowering grade of Genesee ave.; cost \$25,548.

Aitkin, Minn.—County Board is considering construction of roads.

Bemidji, Minn.—Council is considering an appropriation of \$12,000 for paving streets of business district.

Crookston, Minn.—Council will lay four miles of cement walks.

Gilbert, Minn.—Missabe Mountain Town Board is considering laying out of new township road between Gilbert and the Elba location.

St. Paul, Minn.—Ramsey County has \$75,000 available for improvement of roads.

Gulfport, Miss.—Issuance of \$50,000 road bonds is being considered.

Starkville, Miss.—Citizens Committee has raised over \$2,500 toward construction of model road between this town and college.

Sedalia, Mo.—Council has passed resolution for paving of 3d st.

Billings, Mont.—Council has passed ordinances providing for paving of north side business section of city; cost about \$120,150; bids will be received until about June 7.

Hastings, Neb.—Specifications will be prepared for paving 2d st.; bids will be advertised.

Omaha, Neb.—Cost of construction of street mains from Florence to Lake st. has been estimated at \$300,000.

Cranford, N. J.—Macadamizing of Lincoln ave. is being considered.

Glen Ridge, N. J.—Glen Ridge and Bloomfield will jointly improve Edgewood road.

Hackensack, N. J.—Plans have been prepared and bids will soon be asked for improvement of Paterson plank road.

Hackettstown, N. J.—Council has decided to improve Main st.; improvement of Prospect ave. with macadam, cost \$2,500, is being considered.

Harrisonville, N. J.—Senate has appropriated \$10,000 for repair and rebuilding of road from this town to Fort Mott.

Jersey City, N. J.—Hudson County has sold \$150,000 Newark plank road improvement and \$100,000 repair bonds to N. W. Harris & Co. and Kountze Bros., of New York.

Newark, N. J.—New bids will be received for furnishing 50,000 gals. of road oil.

Perth Amboy, N. J.—Council is considering paving of High st. with asphalt block and New Brunswick ave. with vit. brick.

Plainfield, N. J.—Council is considering \$30,000 street improvement bond issue. Address Chairman Gloak of Street Committee.

Rutherford, N. J.—Bids will be received at once for macadamizing sections of four avenues.

Trenton, N. J.—Board of Freeholders has decided to construct road to connect Pennington and Harborton rds., Hopewell Township; cost \$30,000.

Trenton, N. J.—Street Committee is considering widening of Franklin st.

Albany, N. Y.—Bids will soon be advertised for paving Washington st.

Buffalo, N. Y.—Department of Public Works has recommended that brick be substituted for stone in paving of Best and Sycamore sts.

Elmira, N. Y.—Board of Public Works has ordered construction of 25 new sidewalks and repair of 15 others.

Little Falls, N. Y.—Council has passed resolutions instructing Board of Public Works to pave North Ann st., to build culverts on White st. and make necessary repairs on Skinner, King and Furnace sts.; sets of altered plans have been presented to Board ranging from gravel road, to cost \$975 more than original estimate, to 14-ft. macadam road, with bituminous top dressing, to cost \$19,975 more than original estimate.

Mt. Vernon, N. Y.—Street and Walks Committee has recommended paving of 6th st.; cost \$17,000.—Alderman Van Tassel, Chairman.

Newburgh, N. Y.—Cost of paving Water and Colden sts. is being considered.

New York, N. Y.—Board of Aldermen will ask Board of Estimate to appoint committee to investigate establishment of board walk along beach front, Coney Island.

Utica, N. Y.—Board of Contract and Supply has rejected all bids for paving 12 streets; new bids will be asked.

Mebane, N. C.—Bids will be received May 16 for \$15,000 street improvement bonds.—J. T. Shaw, Mayor.

Wadesboro, N. C.—Contracts will be let about June 1 for paving; cost about \$25,000; crushed rock or gravel, covered with tar selected as materials.—Gilbert C. White, Durham, Engineer.

Akron, O.—Plans are being prepared for the construction of Arlington road.

Ashland, O.—Estimates will be prepared by County Engineer T. Brindle for improvement of four roads.

Bellevue, O.—Citizens are considering paving of Fairfield ave. with brick.—William List, Mayor.

Canfield, O.—Township Trustees will macadamize 2½ miles of road.

Canton, O.—Jackson Township is urging construction of highway half mile in length.

Cincinnati, O.—Surveyor Cowen has been instructed to prepare plans and specifications for improvement of Harrison and New Haven road; estimated cost \$25,635; surveyor will prepare specifications for repair and oiling of Montgomery pike; cost \$9,391.

Cincinnati, O.—Cost of improving Ludlow ave. has been estimated at \$22,213.50.

Cincinnati, O.—Council has ordered improvement of McMillan st. with wood block.

Cleveland, O.—Cuyahoga County Commissioners have sold \$41,250 bonds for improvement of Bradley road.

Coldwater, O.—Citizens have voted \$14,000 bonds for street improvements.

Columbus, O.—Plans are being prepared for paving of Summit st.; distance 1½ miles.

Franklin, O.—Council will soon advertise for bids for paving S. Main st.

Mansfield, O.—Bids will be received May 27, noon, for \$23,300 general street improvement bonds.—Huntington Brown, Mayor.

Norwalk, O.—Plans are being prepared by County Surveyor John Laylin for construction of 2½ miles of stone road.

Norwood, O.—Hamilton County Commissioners will pave Montgomery ave. with granite block; cost \$70,000.

Springfield, O.—Council has decided to pave W. Main st. with asphalt.

Springfield, O.—Bids will be asked for improvement of three streets.—Wm. Mahoney, City Clerk.

Struthers, O.—Council has passed ordinance for paving Bridge st. with brick.

Toledo, O.—Public Improvement Committee has decided to improve Summit ave. extension; County Commissioners will macadamize stone road between road and paved street.

Wauseon, O.—Bids will be received May 16, 11 a. m., for \$72,000 road bonds.—C. J. Ives, County Auditor.

Wooster, O.—Council has passed an ordinance for paving of Madison and Quinby aves.—H. H. Franks, City Clerk.

Youngstown, O.—Council has passed resolutions for paving portions of six streets.

Bartlesville, Okla.—Chickasha residents are urging paving of that thoroughfare.

Baker City, Ore.—Council has decided to pave Washington and Court sts. with bitulithic.

Chester, Pa.—Paving of Madison ave. is being urged.

Coatesville, Pa.—The Intercountry Good Roads Association has applied to Chester County courts for charter; object being improvement of Lancaster pike between Coatesville and Gap.

Etna, Pa.—Council has decided to issue \$50,000 bonds for widening and improving Butler st.

Harrisburg, Pa.—Finance Committee of Councils has sent all of ordinances providing for paving of 26 miles of streets and alleys to Special Committee, to be known as Subcommittee on Ways and Means.—M. B. Cowden, City Engineer.

Johnstown, Pa.—Johnstown and Indiana Turnpike Co. will improve Cramer pike.

Mechanicsburg, Pa.—Council has passed ordinance providing \$10,000 for grading and macadamizing all approaches to town and portions of eight streets.

Westerly, R. I.—Widening and grading of Union st. is being considered.

Marion, S. C.—Bids will be received June 1 for \$100,000 highway bonds.—L. D. Lide, Marion, Clerk Road and Highway Commission.

Spartanburg, S. C.—Spartanburg County will construct road from Spartanburg to North Carolina line; distance 36 miles.—S. H. Culbreath, County Commissioner.

Memphis, Tenn.—City will pave Rayburn blvd. with bitulithic.

Athens, Tex.—Construction of several miles of good roads in this precinct is being considered.

Georgetown, Tex.—Williamson County Commissioners have appropriated \$4,900 for road work.

Waxahachie, Tex.—Maypearl and vicinity will vote June 4 on \$25,000 road bonds.

Farmington, Utah.—Davis County Commissioners have appropriated \$6,000 for improvement of roads.

Portsmouth, Va.—City has \$125,000 available for street improvements; contracts will soon be let.—S. T. Montague, Vice-Chairman Street Committee.

Olympia, Wash.—Road will be built between Lakes Crescent and Sutherland; also to Turner's Flats.—H. L. Bowlby, State Highway Commissioner.

Seattle, Wash.—State Highway Commission will at once construct proposed Snoqualmie Pass road across Cascade Mountains; cost about \$15,000.

Huntington, W. Va.—Citizens have voted \$300,000 street and sewer improvement bonds.—Rufus Switzer, Mayor.

Morgantown, W. Va.—County Commissioners have decided to pave road in Grant district; plans will be prepared by County Engineer Hennen.

Antigo, Wis.—Board of Public Works has decided to pave seven blocks with crushed rock macadam.

Cheyenne, Wyo.—Establishment of uniform grades for entire city for street, sidewalks, curbing, gutters and storm sewers is being considered.

Niagara Falls, Ont., Can.—Queen Victoria Park Commission has asked for appropriation for construction of nine miles of Fort Erie-Niagara Blvd.

CONTRACTS AWARDED

Los Angeles, Cal.—Paving with asphalt portion of Washington st., to C. W. Brashier, Pacific Electric Bldg., \$70,000.

San Francisco, Cal.—Repairing with asphalt portion of Mission st., to Al. Ralsch, \$33,000.

New Haven, Conn.—Paving Frank st. with bituminous macadam, to C. W. Blakeslee & Sons, \$3,715.

Washington, D. C.—Paving with asphalt-macadam 13th st., bids opened April 26, to Cranford Paving Co., 2620 E st., N. W., about 11,000 sq. yds., \$3c.

Savannah, Ga.—Furnishing 1,100,000 asphalt paving blocks for improvements to three streets, to Barber Asphalt Paving Co., \$58,000.

Mendota, Ill.—Paving N. Main st. to Keyes & McNamara, La Salle, \$16,041.

Anderson, Ind.—Paving Columbus ave. with brick, Madison County, to Lawson & Kincaide, Indianapolis, \$23,000.

Evansville, Ind.—Paving Powell ave. with asphalt to Western Construction Co.

Marion, Ind.—Constructing J. W. Keever road, to Crosby & Co., Wells County, \$8,539; L. M. Cole road, to same company, \$7,474; 11 arches, to E. R. Hoover & Co.

Portland, Ind.—Constructing Ollo Van Matre 3-mile gravel road, to Buckley & Gardner, Jackson Township.

Fort Dodge, Ia.—Extensive paving east of 12th st., to Bryant, Ford, McLaughlin Co., \$1.98 per sq. yd. for paving 69,000 sq. yds. exclusive of 11,050 sq. yds. of paving on street railway lines; for extra grading, 10,000 cu. yds., 1,000-yard haul, 39c. per cu. yd.; overhaul, 1c. per cu. yd., 34,400 lin. ft. combined curb and gutter, 65c. per lin. ft.; for pavement on street car tracks, \$3.10 per sq. yd.

Harlan, Ia.—Paving streets on the public square, to Lana Construction Co., \$54,000.

Oskaloosa, Ia.—Paving city market place, to Nagden & Shelley, Des Moines; sidewalk and curb, to R. Weatherwax.

Fredonia, Kan.—Brick paving, 10,000 sq. yds., to Harvey Stiver, Kansas City, Mo., \$1.89 per sq. yd.

Portland, Me.—Cement for use in Street and Sewer Department, to Winslow & Co., \$1.75 per bbl.

Fall River, Mass.—Constructing granolithic sidewalks to O'Connor & Angell, \$1.43½ per sq. yd.

Atlantic City, N. J.—Paving to United Paving Co., of Asbury Park, about \$500,000.

Westfield, N. J.—Placing tarvia on roads to Weldon Contracting Co.

Albany, N. Y.—Concrete walks on Manning blvd., to Mulderry Bros., \$12,498.14; improving Benson st., to John M. Holler, \$2,181.

Little Falls, N. Y.—Paving N. Ann st., to Warren Bros., \$12,741.

North Hempstead, L. I., N. Y.—Macadamizing New Hyde Park road, to Andrews Bros., Mineola, \$11,404.

Nyack, N. Y.—Paving Franklin st., to Duell & Holloway, Tarrytown, \$2.23 per sq. yd.

Olean, N. Y.—Paving S. Union st. with vit. brick, about 4,100 sq. yds., bids opened May 2, to Dennis D. Dugan, about \$9,700.

Canton, O.—Improvement of West Brookfield road, to Philip Diefenbacher & Son, Massillon, \$24,626.93.

Cleveland, O.—Paving 2½ miles of roads, to Adams Bros., Zanesville, about \$35,000.

Grant's Pass, Ore.—Paving 15 blocks with bitulithic to Warren Construction Co., about \$74,000.

Portland, Ore.—Improving Sandy road with bitulithic pavement, to Pacific Bridge Co., \$57,167.

Portland, Ore.—Improve King's Heights district to Barber Asphalt Paving Co.

Chambersburg, Pa.—Steam road roller, to J. Q. Case Co., Racine, Wis., \$2,212, or \$1,980 cash.

New Castle, Pa.—Paving County Line st., to J. H. & M. E. Miller, for \$6,708.

Oil City, Pa.—Paving five streets to Vetter Construction Co., about \$58,000; W. 1st st. to Amsler & Co., \$14,100.

Pittsburg, Pa.—Furnishing 250,000 gals. liquid asphalt road oil, bids opened April 25, to Atlantic Refining Co., city, 3c. per gal.

Murray, Utah.—Paving Wasatch ave., to Jas. Wood.

Norfolk, Va.—Hauling dirt to fill in 12th st. to H. D. Legge, 24½c. per cu. yd.

Ellensburg, Wash.—Asphalt street paving to D. A. Williams Co., at following bid: Clearing and grubbing, lump sum, \$2,000; 44,860 sq. yds. asphalt pavement, \$2.08; 3,700 sq. yds. brick gutters, \$6; 640 sq. yds. brick alley crossings, \$3; 17,160 cu. yd. excavation for paving, 70c.; 16,600 lin. ft. concrete curb, 40c.; 2,000 sq. yds. concrete sidewalk, \$1.25; 1,500 lin. ft. wooden stops, 40c.; 380 cu. yds. concrete, \$8; 1,000 cu. yd. excavation and back-fill for culverts, 50c.; 800 lin. ft. 6-in. pipe sewer, 50c.; 1,600 lin. ft. 8-in. pipe sewer, 60c.; 1,700 lin. ft. 10-in. pipe sewer, 70c.; 80 lin. ft. 15-in. pipe

sewer, \$1; 80 lin. ft. 24-in. pipe sewer, \$2.35; 42 manholes, each, \$35; 48 inlets, each, \$15; 700 lin. ft. 6-in. water mains, steel, \$1; 500 lin. ft. 8-in. water mains steel, \$1.50; 2,500 lbs. ¼x1, ½x1½ iron angle bars, 6c.; total, \$140,178.80.

Spokane, Wash.—Paving, Second Ward Improvement District No. 1, Cannon Hill Park addition, to Barber Asphalt Co., \$52,395, \$1,572 for maintenance; granitoid, 6th ave., Stevens to Wall st., to R. S. Blome & Co., \$9,000, \$450 for maintenance; 6th ave., Wall to Post st., to R. S. Blome & Co., \$2,800, \$140 for maintenance; curbing and sidewalk, division, Sprague ave. to 1st ave., to John Fife, \$384; Gordon, Pittsburg to Helena st., to C. M. Payne, \$2,068; Haven, Sprague ave. to 6th ave., to Massie Bros. & Long, \$6,637; 9th ave., Pittsburg to Bryant st., to Abbott & Joslin, \$6,900; Nevada Francis to Rowan st. to Mitchell Bros., \$7,578.

Youngstown, Wash.—Constructing five miles of country road south of Youngstown to J. T. Donaldson & Co. \$18,519.

BIDS RECEIVED

New Haven, Conn.—Belgian block pavements in portions of State st. and Congress ave., C. W. Blakeslee & Sons, \$12,750 and Field, Barber & Underwood, Philadelphia, \$10,920.

Evansville, Ind.—Paving two streets with asphalt, bidders: Stinchfield & Reichert, \$1.85 and \$1.87½; Western Construction Co., \$1.96; same streets brick, Hollerbach & May, lowest bidders, on Carlyle repressed brick, \$1.45.

New Bedford, Mass.—Supplying city with 150,000 block pavings, more or less, J. B. Sullivan & Son, \$1.50 per sq. yd.; Simpson Bros. Corporation, \$1.69 per sq. yd.; the Smith Granite Co., Westerly, R. I., \$1.37 per sq. yd.; Cato Granite Co., \$1.39 per sq. yd.; New England Granite Works, \$1.40 per sq. yd.; Webb Granite and Construction Co., \$1.80 per sq. yd.

Duluth, Minn.—Paving—Bitulithic, Duffor & Riches, \$46,972; Warren Bros., \$47,193; E. A. Dahl, \$47,587; Ed. Johnson, \$48,563. Brick, Duffor & Riches, \$41,832; E. A. Dahl, \$42,609; Russell Construction Co., \$43,278; E. Johnson, \$43,766; Fielding & Shepley, \$44,397. Cressed block, E. W. Van Hatten, \$43,052; Russell Construction Co., \$44,651; E. A. Dahl, \$44,840; Kettle River Co., \$45,011; Duffor & Riches, \$45,084; E. Johnson, \$46,331.

Ft. Lee, N. J.—Constructing about three miles of cement sidewalks, Geo. M. Brewster Construction Co., Tenafly, \$25,693; Vandenberg Construction Co., New York, N. Y., \$20,943; Edward English, Englewood, \$23,620; Nicolli Sciolli, Grantwood, \$20,458; Fusco Construction Co., Newark, \$23,505; Commonwealth Roofing Co., Jersey City, \$32,347; Andrew E. Foye Co., New York, N. Y., \$19,098, and \$21,269 with steel nosing for curb; Cement Paving Co., Jersey City, \$21,236.

New York, N. Y.—Regulating, grading, paving, curbing and laying sidewalks on 41st st., Barber Asphalt Paving Co., 30 Church st., city, \$27,424; Hastings Paving Co., 25 Broad st., city, \$28,280; Grant ave., Cranford Co., 207 Centre st., city, \$20,052; Barber Asphalt Paving Co., 30 Church st., city, \$22,454; Uvalde Asphalt Paving Co., 1 Broadway, city, \$20,706; Borough Asphalt Co., 1301 Metropolitan ave., Brooklyn, \$20,637.

Plattsburgh, N. Y.—Construction of 1,000 yds. of granolithic sidewalks and driveways, Geo. Phair, lowest bidder, 98 9-10c. per yd.

Utica, N. Y.—Paving 12 streets, John R. Lee, Paterson, N. J., lowest bidder, as follows: Asphalt, \$1.85 per sq. yd.; resurfacing asphalt, \$1.25; tile drains, 25c.; new stone curb, 75c.; old stone curb reset, 45c.; artificial stone curb, 60c.; price given per lin. ft. on curbing; sandstone sidewalks, 20c.; artificial stone walks, 20c.

Eaton, O.—Paving portion of E. Main st., G. H. Heffner & Son, Celina, \$11,685; J. O. Shoup & Co., Dayton, \$14,195; Geo. Poos, city, \$12,962, and Karch, Karch & Fishbaugh, Celina, \$14,534.

Norfolk, Va.—Paving in Greater Ghent, bidders: Atlantic Bitulithic Co., of Richmond, bitulithic, \$2.05 per sq. yd., repairs \$2.50; Barber Asphalt Paving Co., of Philadelphia, sheet asphalt, \$1.89 per sq. yd., repairs \$2.50; Commonwealth Construction Co., of New York, sheet asphalt, \$1.79 per sq. yd., repairs \$1.79; bituminous concrete, \$1.68 per sq. yd., repairs \$1.68.

Seattle, Wash.—Grading Hamlin st., S. Normile only bidder, \$10,303; Western ave., paving, T. Ryan, for street and alley crossing, granite, \$128,458; sandstone, \$124,622.64; brick and granite, \$125,578.53; brick and sandstone, \$122,390.64; maintenance, \$2,878.26. Hans Pederson, granite, \$129,780.95; sandstone, \$127,649.90; brick and granite, \$127,260.95; brick and sandstone, \$125,489.90; maintenance, \$4,111.80. Stewart st., paving: Barber Asphalt Paving Co.,

Mechanicsburg, Pa.—Paving 23,300 sq. yds., foundation and surface bids are separate, (a) Central Construction and Supply Co., Harrisburg, asphalt \$1.20, wood block \$2.40; (b) U. S. Wood Preserving Co., 165 Broadway, New York, wood block \$1.90; (c) Reilly and Fritz, Lancaster, no bid; (d) Juniata Paving Co., Empire Bldg., Philadelphia, bitulithic \$1.60; (e) Filbert Paving Co., Pennsylvania Bldg., Philadelphia, sheet asphalt \$1.33, fibertine \$1.06; (f) Standard Bitulithic Co., 253 Broadway, New York, bitulithic \$1.60; (g) Barber Asphalt Co., Philadelphia, sheet asphalt \$1.22; (h) Hassam Paving Co., 311 Main st., Worcester, Mass., Hassam with foundation \$1.65; Apposite on concrete \$1.60; (j) Chas.

T. Eastburn, Yardley, Amiesite \$1.05; (k) S. B. Leach & Co., Lemoyne, no bid; (l) Wm. F. Martin, W. Fairview, U. S. S. P. Co. brick and Glangary block \$1.64; (m) Stucker Bros. Construction Co., Harrisburg, asphaltic macadam 94c., vit. brick, 23,300 sq. yds., all block, (a) Patton shale \$1.55; Pennsylvania clay fire clay \$1.60; Mack F. C., \$1.63; Porter F. C., \$1.65; Metropolitan Shale, \$1.85; (c) Patton Shale, \$2.12; Mack, F. C., \$2.00; Metropolitan shale, \$2.10; Clymer, F. C., \$2.05; (k) Patton shale, \$1.50; Pennsylvania clay, fire clay, \$1.51; Mack, F. C., \$1.53; Porter, F. C., \$1.54½; Metropolitan shale, Standard of Clearfield, \$1.52; Clymer, F. C., \$1.55; (m) Porter, F. C., \$1.42; Metropolitan shale, Shamut, \$1.44.

	Concrete Curb, 10,000 Lin. Ft.	Wain- wright Curb, 200 Feet	4-inch Concrete Found'n, 23,300 Sq. Yds.	Resurfaced Macadam Found'n, 23,300 Sq. Yds.	Extra Concrete Per Cubic Yard	Extra Stone Rolled Per 2,240 Lbs.	Time, Days, @ \$20
A.....	\$0.38	\$0.63	\$0.45	.....	\$4.68	\$2.25	*
B.....	.....	.....	.....	\$0.50	5.50	2.00	60
C.....	.47	.67	1.50	.50	8.00	1.77	75
D.....	.47	.80	.59	.25	6.00	1.69	50
E.....	.39	.57	.70	.50	4.90	2.25	80
F.....	.....	.....	.65	.31	6.50	2.00	40
G.....	.41	.58	.75	.....	5.00	.....	60
H.....	.....	.....	.....	.40	7.50	2.00	60
J.....	.....	.....	.70	.....	.....	.....	60
K.....	.40	.68	.....	.34	6.75	1.69	60
L.....	.44	.72	.52	.....	.....	.....	60
M.....	.48	.65	.55	.35	.....	1.50	..

* Asphalt, 45 days; block, 60 days.

curved granite and straight concrete curb, \$81,572.60; armored concrete curb, \$80,575.10; straight armored concrete and curved granite curb, \$83,448.80; armored concrete and straight granite curb, \$88,392.60; curved armored concrete and straight armored concrete curb, \$82,451.30; maintenance, \$230.40.

SEWERAGE

Phoenix, Ariz.—Citizens will vote May 23 for \$33,000 for construction of sewer system.

San Francisco, Cal.—Finance Committee has voted \$170,000 for construction of 7th st. sewer.—John A. Kelly, Chairman.

Visalia, Cal.—Contracts will soon be let for 860 lin. ft. of reinforced concrete conduit for carrying creek through city and 2,040 lin. ft. of like conduit of lighter construction; \$95,500 bonds will be sold May 18.—Morve L. Weaver, City Engineer.

Boulder, Col.—Council has ordered construction of sewer in Chautauqua Heights and University Place.—A. A. Greenman, Mayor.

Plainville, Conn.—A. H. Crudell, President of the Business Men, has selected a committee of three to look over plans for sewer system.

Arcadia, Fla.—Citizens have voted \$12,000 bonds for extension of sewerage system.

Milton, Fla.—Citizens have voted \$10,000 bonds for sewerage.

Sylvania, Ga.—Citizens have voted \$40,000 bonds for construction of sewer system, electric light plant and water works.

Hailey, Ida.—Engineer L. C. Kelsey, 402 Dooly Bldg., Salt Lake City, has been employed to design and superintend construction of sewerage system; estimated cost \$50,000.

Chicago Heights, Ill.—Council is considering construction of storm sewer No. 3.

Highland Park, Ill.—Citizens have voted \$4,000 bonds for installing septic tank at foot of Ravine drive.

Joliet, Ill.—Construction of sewer in Willard st. is being considered.

Waukegan, Ill.—Council has passed resolution for construction of sewers in portions of three streets.—H. Thacker, City Clerk.

Columbus, Ind.—Council has ordered plans prepared for construction of trunk sewer and widening of Haw Creek.

La Fayette, Ind.—Council has voted \$15,000 appropriation toward construction of the Congress st. sewer; total cost \$36,000.

Cedar Falls, Ia.—Council is considering construction of sanitary sewer in portions of six streets.—H. Joseph Pfeiffer, Mayor.

Colfax, Ia.—Plans are being prepared by Engineer Watkins, Iowa City, for 12,000 ft. of sewers.

Council Bluffs, Ia.—City proposes to expend \$150,000 this year in sewer and street improvements.

Leon, Ia.—City will expend \$6,000 to \$8,000 for pipe sewers.—S. G. Mitchell, City Clerk.

Tama, Ia.—Council is considering construction of sewer system.

Lexington, Ky.—Extension of sewer system is being considered.

New Orleans, La.—City Engineer Hardee has prepared plans for installation of sub-surface drainage system in Morgan blvd.

Attleboro, Mass.—Town has appropriated \$200,000 for first work on installation of system of sewage disposal; total cost \$450,000.—Dr. C. S. Holden, Chairman.

Salem, Mass.—William S. Johnson, Boston, Sanitary Engineer, is making a study of sewage disposal along north shore.

Owosso, Mich.—City will construct sewers at cost of \$30,000.

North Greenwood, Miss.—City will construct sewer system; bids asked.

Tecumseh, Neb.—City Engineer Gore has prepared plans for proposed sewer system.

Camden, N. J.—Council has decided to construct sewers on five streets.—A. L. Sayers, Street Commissioner.

Linden, N. J.—Borough is considering proposition to construct, in conjunction with Roselle, joint trunk sewer from Roselle to tidewater through this village.

Plainfield, N. J.—Bids for extension of sanitary sewer have been ordered advertised. Address Chairman Gloak of Street Committee.

Westwood, N. J.—Installation of sewerage system is being considered.

Newburgh, N. Y.—Board of Health has recommended construction of sewer on West st.

Niagara Falls, N. Y.—Bids will be received May 19, 3.30 p. m., for \$20,500 bonds for construction of sewers.

Old Forge, N. Y.—Village has voted \$250 for laying trunk sewer on Harrison ave.

Penn's Grove, N. Y.—Clyde Potts, Civil and Sanitary Engineer, 30 Church st., New York, N. Y., has been retained by the Borough of Penn's Grove to design sewers and sewage disposal for that borough.—Fred A. Gentieu, Mayor; Asa G. Justice, Clerk.

Defiance, O.—City Engineer Carl Smith has estimated cost of constructing 1,050 lin. ft. sewer on 4th st., with 22, 18 and 8-in. pipe, at \$3,183.

Fostoria, O.—Bids will be received in about 40 days for constructing 675 ft. of

10 or 12-in. sewer in E. Tiffin st.; also for 600 ft. of 10 or 12-in. in Lytle st.—E. C. Leace, Director of Public Service.

Galion, O.—Council has ordered construction of lateral sewers in Eighth and Ninth Districts and part of Fifth District.

Hamilton, O.—Plans have been prepared for storm sewers on Vine and 9th sts.; cost \$9,122; engineer also submitted plans, profiles and specifications for sanitary and house connections on 8th st.; cost \$1,799.

Mansfield, O.—Council has adopted resolutions for construction of sewers in three streets.

Marble Cliff, O.—Construction of sewage disposal plant is being considered.

Sandusky, O.—Council has passed ordinance providing for construction of 2,000 ft. 24-in. sewer in Venice road.—R. B. Smith, City Engineer.

Springfield, O.—Bids will be asked for construction of large number of sewers.—Wm. Mahoney, City Clerk.

Wilmington, O.—Plans and specifications for proposed sewerage system have been approved.—L. I. Compton, Engineer.

Wooster, O.—Council has passed an ordinance for construction of sewer in Quinby ave.—H. H. Franks, City Clerk.

Zanesville, O.—City will let contract about July 15 for construction of sewers aggregated to cost \$27,400.

Lawton, Okla.—Citizens have voted \$40,000 sewer bonds.

Baker City, Ore.—Council has decided to construct sewer in Center st. with connections in three other streets.—Jas. H. Nichols, Clerk.

Lebanon, Ore.—Plans are being prepared for proposed sewerage system; election on bonds will be called.

Salem, Ore.—Plans are nearly completed for proposed sewer system.

Connellsville, Pa.—Residents of Hill st. are urging construction of sewer.

Erie, Pa.—Council is considering measures including three sections of Mill Creek sewer interceptor along Front st., for which \$25,000 is appropriated as far as canal sewer, \$23,000 to Little Cascade sewer, and \$19,000 to Cranberry st. sewer.

Ligonier, Pa.—Consulting Engineer F. H. Shaw, Wanner blk., Reading and Lancaster, has nearly completed plans for storm water sewer.

Central Falls, R. I.—Council is considering \$1,200 appropriation for sewer on Foundry and Railroad sts.

Woonsocket, R. I.—Committee on Sewers has recommended construction of sewers in seven streets; cost \$10,710.

Gaffney, S. C.—Bonds have been sold for construction of sewer system.

Union City, Tenn.—Construction of sewer system is under consideration.—J. A. Coble, Mayor.

Dallas, Tex.—Bids have been ordered for laying sewer on Carlisle st.

Lampasas, Tex.—Construction of sewer system is being considered.

Prosser, Wash.—Plans and specifications will be prepared by City Engineer F. A. Jenne for construction of sewer system.

Seattle, Wash.—Board of Public Works has rejected bids for constructing Lake Washington District section of North trunk sewer; work will be readvertised.

Spokane, Wash.—Plans have been prepared by Board of Public Works for construction of intercepting sewer No. 1; cost \$203,396.

Huntington, W. Va.—Citizens have voted \$300,000 sewer and street improvement bonds.—Rufus Switzer, Mayor.

Prairie Du Chien, Wis.—Survey has been made of preparatory to preparation of plans for construction of sewer system.

Klamath Falls, Ore.—Sewer system, bidders as follows: (a) entire system, Edgar B. Chamberlain, \$97,000; (b) Burtis & Vandeleur, proposal C, for system, labor included, leaving out septic tank and pipe, \$15,825; (c) Western Bridge and Construction Co., entire system, \$26,918; (d) Waldie Construction Co., entire system except pipe, \$22,400; (e) same company, entire system, \$28,890; (f) Chico Construction Co., entire system, except pipe, \$16,900; (g) same company, entire system, \$23,700; (h) John Heafey, Oakland, entire system, \$28,700; (i) Wengler & Stabler, proposal D, entire system, complete, \$19,200; (k) Keasel Construction Co., Tacoma, proposal D, entire system, complete, \$36,521; (l) Arthur S. Bent, proposal D, complete, \$32,500. Following prices per foot include Ys and Ts and laying in earth:

	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(K)	(L)
6" pipe.....	\$0.85	\$0.85	\$0.80	\$0.37	\$0.67	\$0.85	\$0.55	\$1.00	\$0.90
8" ".....	.90	.60	.95	.40	.79	.90	.62	1.15	1.10
10" ".....	1.00	.70	1.20	.43	1.00	1.19	.78	1.25	1.25
12" ".....	1.05	.80	1.45	.46	1.16	1.20	1.05	1.55	1.50
14" ".....	1.10	.90	1.80	.50	1.39	1.40	2.10	2.00	1.75
LAYING PIPE IN ROCK									
6" pipe.....	.....	1.50	2.00	1.50	1.80	1.95	.....	6.28	2.25
8" ".....	2.90	1.85	2.20	1.55	1.85	2.90	.....	6.38	2.60
10" ".....	3.00	2.00	2.50	1.60	2.18	2.16	.....	6.55	3.00
12" ".....	3.10	2.20	2.90	1.65	2.35	2.28	.....	6.77	.....
14" ".....	3.20	2.50	3.40	1.70	.....	2.40	.....	7.15	3.75

Keasel Constr. Co. submitted a bid for laying pipe in loose rock, as follows: 6-in. pipe, \$3.28 per ft.; 8-in., \$3.38; 10-in., \$3.55; 12-in., \$3.77; 14-in., \$4.15; (c) septic tank, \$3600; (d) septic tank, \$4400; manholes, \$54; inspection holes, \$7; (f) septic tank, \$2970; manholes, \$45; inspection holes, \$5; (h) septic tank, \$2750; manholes, \$50; inspection holes, \$5; (j) septic tank, \$1800; (k) septic tank, \$5920; (l) septic tank, \$3500; manholes, \$50; inspection holes, \$5; Klamath Falls Iron Co., manhole covers, \$19; lamphole covers, \$2.75.

CONTRACTS AWARDED

Stuttgart, Ark.—Constructing tile pipe sewers, bids opened April 25, to the Kress Construction Co., Oklahoma City, Okla., for \$17,130.—W. S. Shields, 1201 Hartford Bldg., Chicago, Ill., Engineer.

Leavenworth, Kan.—Construction of sewers in Ninth District, to McGuire & Stanton, \$34,954.10.

Louisville, Ky.—Contract 65, calling for sewers on 15th and 23d sts., to B. C. Miller Sons Co., \$15,998.—J. B. F. Breed, Chief Engineer.

Detroit, Mich.—Installing 6,000 yds. of concrete, 200 tons of steel and excavating 20,000 yds. of dirt for sewage tank in connection with pumping station, to Carey Construction Co., Cleveland, \$136,000.

Belmar, N. J.—Constructing sewage disposal works, bids opened May 3, to J. W. Heller, 738 Broad st., Newark, \$14,900.—Clyde Potts, 30 Church st., New York, N. Y., Engineer.

Yonkers, N. Y.—Park sewers, to Charlton & Weston, \$3,300; grading, to same firm, Ridgewood ave., \$19,359, and Park ave., \$10,450.

Woodward, Okla.—Sanitary sewers, 13 miles, to American Light and Water Co., Kansas City, Mo.; cost \$63,500.

Norristown, Pa.—Furnishing vit. sewer pipe, to James McGinnis, American Sewer Pipe Co., 6½-in., 8½-in., 8-in., 15-in., 10-in., 22-in., 29-in., 15-in., 49-in., 18-in., 64-in., 20-in., 87-in., 22-in., \$1.10; 24-in., \$1.25; 30-in., \$2.25, and 36-in., \$3.50 per lin. ft., all sizes down to 12-in. to be double strength except 30 and 36-in., which are to be standard.—S. Cameron Corson, Borough Engineer.

Newport News, Va.—Two carloads of sewer pipe, to H. R. Booker, Hampton.

BIDS RECEIVED

Cranford, N. J.—Sewer in North ave., E. Matthew Wade & Sons, Elizabeth, \$38,980 for 18-in. sewer, and \$38,040 for 15-in.; Harrison Construction Co., \$18,640 and \$17,417, and Louis Jaques, \$17,239 and \$16,299.

Calgary, Alta., Can.—Tenders received for sewer pipe at City Engineer's office; also for sewer and water extensions.

WATER SUPPLY

Safford, Ariz.—Citizens have voted to install water works plant.

Hartford, Ark.—City Council appointed committee, A. B. Colvin, Chairman, to confer with company which proposes to construct water works.

Waldron, Ark.—Plans are being prepared by E. W. Gantt, of Sequoyah Engineering Co., Fort Smith, for water works.

Alamosa, Col.—Installation of water system, cost \$65,000, is being considered.—Peter Lund and J. R. Gordon, Engineers.

Arcadia, Fla.—Citizens have voted \$12,500 bonds for extension of water works system.

Milton, Fla.—Citizens have voted \$25,000 bonds for water works.

Sylvania, Ga.—Citizens have voted \$40,000 bonds for construction of water works, electric light plant and sewer system.

Meridian, Ida.—Citizens are considering \$30,000 bond issue for 65,000-gal. steel tank, 40-hp. electric pump, laying 3 miles of mains and erecting \$1,500 building.

Beecher, Ill.—Citizens have voted to install water works system.

Rankin, Ill.—Citizens have voted to install water works.

Waukegan, Ill.—Council has passed ordinance for constructing water supply pipe in portion of Brookside ave.—H. Thacker, City Clerk.

Columbus, Ind.—Water Works Commission has decided to recommend installation of water meters.

Connersville, Ind.—J. B. Marvin, of Frankfort, is preparing plans for water works.—Wm. Reeder, City Clerk.

Silver City, Ia.—Business Men's Improvement Club is agitating installation of water works.

Chanute, Kan.—Citizens have defeated proposition to improve water service.

Coldwater, Kan.—City has employed J. S. Worley Co., 206-207 Reliance Bldg., Kansas City, Mo., to prepare plans and specifications for system of water works and lights; cost \$30,000.

Baton Rouge, La.—Water Works Co. proposes to expend about \$50,000 in improvements; work consists of pipe extensions with concrete reservoirs.—J. H. Wood, Secretary.

Berlin, Md.—Town has decided to expend \$15,000 in improving water works and streets.

Ellicott City, Md.—Issuance of \$30,000 bonds for establishment of water works is being considered.

Lowell, Mass.—Appropriation Committee has recommended \$65,000 loan for pump at Centerville pumping station.

Pittsfield, Mass.—Bids will be called for soon for construction of reservoir on Mill Brook; cost \$150,000.—A. B. Farnham, Chief Engineer Board of Public Works.

South Hadley, Mass.—Citizens have decided to accept report of the Water Commission, as prepared by Engineer Fred H. Cook, of Holyoke, for water supply system, cost about \$40,000.

Detroit, Mich.—Fire Commissioner Moran has recommended installation of high-pressure water system.

Marquette, Mich.—Water Board has recommended extension of present intake about 2,500 ft. into about 70 ft. of water; cost about \$63,000.

Austin, Minn.—Council is considering extension of water system.

Brookville, Miss.—Bids will be received June 7 for \$9,000 bonds for construction of water works.—G. B. Baskerville, Macon, Engineer; M. A. Parks, City Clerk.

Tipton, Mo.—Citizens will soon vote on water works bonds.

Creston, Neb.—R. P. Drake, Humphrey, has been selected as engineer for proposed water works.—C. E. Wagner, City Engineer.

Fairbury, Neb.—Citizens have defeated proposition to issue \$135,000 water bonds.

Asbury Park, N. J.—Former Commissioner Wm. L. Gordon will ask Council for franchise to lay mains for conveying salt water and supplying salt-water fire-fighting pressure.

		STANDARD									
		2 FT. LONG		2 FT. 6 IN. LONG							
		4-in.	6-in.	8-in.	9-in.	10-in.	12-in.	15-in.	18-in.	20-in.	24-in.
Blackmer & Post Pipe Co.	Lin. ft....	\$0.11½	\$0.18½	\$0.30	\$0.33	\$0.39½	\$0.51½	\$0.76½	\$1.10½	\$1.45½	\$2.02½
	Junctions...	0.19	0.30	0.43	0.48	0.56	0.72	1.10	1.59	2.12	2.95
Canadian Equipment, Calgary	Lin. ft....	0.10½	0.16½	0.26½	0.32	0.38½	0.48½	0.71	0.93	1.20	1.77
	Junctions...	0.31½	0.49½	0.91	1.10	1.30	1.85	2.50	3.27	4.20	6.20
*Stanley Brock, Winnipeg	Lin. ft....	0.10½	0.17	0.26½	0.32½	0.38½	0.49½	0.71½	0.94	1.22	1.81
	Junctions...	0.32	0.50	0.92½	1.13	1.35½	1.92	2.52	3.30	4.23	6.25
*Hamilton & Toronto Sewer Pipe Co.	Lin. ft....	0.11	0.17	0.27	0.34	0.39½	0.53	0.73½	0.96½	1.25	1.80
	Junctions...	0.35	0.51	0.81	1.15	1.24	1.60	2.30	3.00	3.80	5.25
Dominion Sewer Pipe Co.	Lin. ft....	0.11½	0.16½	0.27	0.34	0.39½	0.53	0.75	0.96	1.30½	2.08
	Junctions...	0.45	0.67½	1.12½	1.20	1.20	2.25	3.05	3.80	5.57½	8.77½
Gorman, Clancey & Grindley	Lin. ft....	0.10½	0.15½	0.29½	0.34½	0.38½	0.54½	0.75½	0.96	1.25	1.80
	Junctions...	0.32	0.48	1.01½	1.18½	1.37	1.90½	2.63	3.30	4.23	6.25
Evans & Howard Fire Brick Co.	Lin. ft....	0.11½	0.17½	0.25½	0.30	0.35½	0.45	0.65	0.85	1.10	1.50
	Junctions...	0.37	0.62	0.95	1.06	1.25	1.55	2.10	2.70	3.40	4.70
	Lin. ft....	0.12	0.21	0.30½	0.36½	0.39½	0.53½	0.82½	1.20½	1.32½	2.00
	Junctions...	0.35	0.62½	0.92½	1.12	1.20	1.72½	2.51½	3.73½	4.33½	6.67½
		3 FT. LONG		DOUBLE STRENGTH						BENDS	
		3 FT. LONG									
		30-in.	36-in.	15-in.	18-in.	20-in.	24-in.	30-in.	36-in.		
Blackmer & Post Pipe Co.	Lin. ft....	\$3.55	\$5.50	\$0.86	\$1.07	\$1.66½	\$2.38½	\$4.12	\$6.00	Each	Each
	Junctions...	4.50	6.53	1.20	1.37	2.36	3.36	5.00	7.08	\$0.27	\$0.47
Canadian Equipment, Calgary	Lin. ft....	3.45	5.00	0.84	1.17	1.53	2.19	4.27	6.05	0.21½	0.35
	Junctions...	13.50	19.50	2.90	3.90	5.20	6.65	16.45	22.50	0.22	0.36
*Stanley Brock, Winnipeg	Lin. ft....	3.50	5.00	0.85	1.18	1.56	2.20	4.29	6.10	0.21½	0.35
	Junctions...	13.60	19.60	2.92	3.94	5.23	6.70	16.50	22.60	0.22	0.36
*Hamilton & Toronto Sewer Pipe Co.	Lin. ft....	3.60	5.10	0.81	1.15	1.44	2.28	4.10	5.90	0.21½	0.35
	Junctions...	8.77	12.45	2.45	3.25	4.20	7.01½	10.50	14.50	0.21½	0.35
Dominion Sewer Pipe Co.	Lin. ft....	3.70	5.20	0.80½	1.07½	1.37	2.07½	4.00	5.70	0.21½	0.35
	Junctions...	14.20	20.00	2.77	3.62	4.66	7.08	10.50	14.50	0.21½	0.35
Gorman, Clancey & Grindley	Lin. ft....	3.80	5.30	0.90½	1.28½	1.66½	2.43½	4.34	6.10	0.24	0.45
	Junctions...	14.30	20.10	3.25	4.00	5.70	8.30	16.50	22.60	0.24	0.45
Evans & Howard Fire Brick Co.	Lin. ft....	3.90	5.40	0.89½	1.32	1.50½	2.21½	4.18	5.90	0.35	0.60
	Junctions...	14.20	20.00	2.64½	3.95	4.67	7.06½	15.51	21.50	0.35	0.60
		Loam, Earth, Loose Gravel, etc.	Cemented Gravel, Gumbo, etc.	Loose Rock, Boulders, etc.	Hard Rock	Overhaul Soft Material	Overhaul Boulders, Rock	Hauling and Laying Pipe.			
SEWER EXTENSIONS:											
John Breckenridge, Calgary		\$1.60	\$1.60	\$1.60	\$1.60	1½ cts. per 100 ft.	1½ cts. per 100 ft.	12" 69 cts.	10" 57½ cts.		
Davidson & Westaway, Edmonton		0.90	1.05	1.45	6.00	15 cts.	20 cts.	8" 44 cts.	10 cts. per lin. ft.		
A. C. Stewart & Co., Winnipeg		0.90	1.25	1.00	4.00	2 cts. per 100 ft.	5 cts. per 100 ft.	15 cts. per lin. ft.			
WATER WORKS EXTENSIONS:											
John Breckenridge, Calgary		\$1.55	\$1.55	\$1.55	\$1.55	1½ cts. per 100 ft.	1½ cts. per 100 ft.	19½ cts. per lin. ft.	10 cts. per lin. ft.		
Davidson & Westaway, Edmonton		0.80	1.05	1.45	6.00	15 cts.	20 cts.	\$3.50 per ton			
A. C. Stewart & Co., Winnipeg		0.90	1.25	1.00	4.00	2 cts. per 100 ft.	5 cts. per 100 ft.				

* These two firms did not comply with specifications; they bid on pipe all 2 ft. long.

Chatham, N. J.—Water mains will be extended on three streets.

Hawthorne, N. J.—Coler R. Wise will draw preliminary plans and make estimate of cost of installing water supply system.—M. E. Thompson, Borough Clerk.

Kingsland, N. J.—Township Committee is considering extension of water mains.—J. F. Woods, Clerk.

Plainfield, N. J.—Council has appropriated \$5,000 to employ competent engineer to advise as to water supply.

Rutherford, N. J.—Township Committee has been notified that it can legally bond town for expense of extending water system.

Somerville, N. J.—Preliminary survey for municipal water plant will be begun at once.

Churchville, N. Y.—Establishment of water system is being considered.

Niagara Falls, N. Y.—Village of La Salle is planning to buy plant of private water works company.—Frank Wilson, President.

Potsdam, N. Y.—Board of Water Commissioners desires description of standpipes and cost.—G. A. Littell, Superintendent Water Works.

Schectady, N. Y.—Council has adopted resolution instructing Commissioner of Public Works to call in expert hydraulic engineer to make report as to present water works system.

Spencerport, N. Y.—Bids will be received May 16 for \$39,000 bonds for water works; bids for construction will be received about June 1. Morrison & Farrington, Syracuse, Engineers; W. R. Barrett, President Board Village Trustees.

Youngstown, N. Y.—Bids will be received soon for filters, pump and engines for water works plant.

Murphy, N. C.—Citizens have voted \$25,000 additional water works bonds.

Bellevue, O.—Reinforced concrete retaining wall will be erected at Reservoir No. 1; cost \$3,600.

East Liverpool, O.—State Board of Health has recommended that commission of three experts be appointed to investigate water system.—Saml. Crawford, Mayor.

Urbana, O.—Samuel S. Wyer, Columbus, is preparing plans for water works.

West Carrollton, O.—Wm. Quinn and J. S. McNabb have been appointed committee to ascertain cost of installing water system.

Guthrie, Okla.—Plans have been prepared for improvements to water works system, including filtration, 2,000,000 gals., laying mains from pump house to city, reconstructing present system, etc.; \$50,000 bonds available.—W. S. Spencer, Chemist, Water Works Department.

Lawton, Okla.—Citizens have voted \$40,000 water works extension bonds and \$200,000 to raise dam in Wichita Mountains which supplies city with water.

Johnstown, Pa.—Johnstown Water Co. will issue \$100,000 bonds for work on reservoirs.

Pottstown, Pa.—The Pottstown Gas & Water Co. has increased capital from \$225,000 to \$300,000 for improvements, including filter plant and enlargement of old Washington Mill reservoir.

Barrington, R. I.—Barrington Water Co. will extend lines to serve Bay Spring District; will also extend to "White Church" in near future.

Ipswich, S. D.—Citizens have voted bonds to install water system.

Alpine, Tex.—City will open bids about June 28 on pump and engine to pump water up incline about 400 yds.; desires quotations on pipe. J. H. Derrick can be addressed.

Dallas, Tex.—Bids will be readvertised for hauling 5,325 tons of water pipe.

Weatherford, Tex.—Citizens are urging that improvement be made to water works.

Bountiful, Utah.—Citizens have voted to construct water works.

Norfolk, Va.—Mayor Riddick will urge purchase of additional water meters.

Cofax, Wash.—Water Committee is

planning to install meters throughout city.

Conconully, Wash.—Proposed water works will cost about \$5,000.—A. P. Wheeler, Engineer; F. R. Weeks, Town Clerk.

Hillyard, Wash.—Council has decided to lay 10-in. water main on Market st.

Ilwaco, Wash.—The North Beach Push Club is considering providing Chinook, Ilwaco, Seaview and Long Beach with water system; the water would have a 190-ft. fall.—H. E. Deputy, President.

Tacoma, Wash.—City will have to increase water supply at cost of about \$35,000.—A. V. Fawcett, Mayor.

Keyser, W. Va.—Town will vote May 10 on \$40,000 water works improvement bonds.

Fond du Lac, Wis.—D. W. Mead, Madison, has recommended improvements as follows: Pumping engine, 5,000,000-gal. capacity, \$20,000; a 200-h.p. boiler, \$2,500; rearrangement and connections, \$3,000; new deep well, \$3,000; new deep well pump and motor, \$2,000; changes in reservoir, \$7,500; new mains, 1 to 5-in. \$48,000; total cost for immediate improvements, \$61,000; and also new mains, 6 to 14-in., \$41,500; total cost of immediate and future improvements, \$102,500.

Cody, Wyo.—Bond issue, \$125,000, for installation of gravity water system, is being considered.

Dauphin, Man., Can.—Bids will be received May 16 by J. W. Johnston, Secretary, for \$75,000 water works and sewerage bonds.

Galt, Ont., Can.—Taxpayers will vote May 13 on by-law to issue \$5,000 water works debentures.

Nanaimo, B. C., Can.—Taxpayers have passed by-law to borrow \$20,000 for constructing concrete dam at No. 1 reservoir.

CONTRACTS AWARDED

San Francisco, Cal.—Laying water mains and connections to provide fire protection system, etc., at Presidio, San Francisco, to Pringle, Dunn & Co., \$3,947.

Ft. Oglethorpe, Ga.—Sinking two 8-in. tubular wells, to Perry Andrews and F. C. Butts, \$4,500 each.

Grand Rapids, Mich.—Furnishing water pipes, to Lynchburg Foundry Co., Lynchburg, Va., \$24.85 per ton.

Albert Lea, Minn.—Construction of water mains, to Cook Construction Co., Des Moines, Ia., \$2,932.50; other bidders: Thil-Manning & Whalen Co., La Crosse, \$3,606; Aug. Geesler, city, \$3,669.70; Greene Bros., city, \$3,809.47; W. D. Lovell, Minneapolis, \$2,951.80; Tanner Bros. Minneapolis, \$2,932.50.—Wm. Barneck, City Engineer.

Hinsdale, N. H.—Pipe line 11, Hinsdale, as follows: Pipe, to Chas. Millar & Son, Utica, N. Y., \$25.50 per ton; hydrants and valves, to the Chapman Valve Co., Indian Orchard, Mass., and laying pipe, etc., to Albert & Bowers, Cohoes, \$2,694.—Dudley & Sawyer, Manchester, Engineers.

Buffalo, N. Y.—Installing water-tube boilers at Porter ave. pumping station, to Farrar & Trefts, of Buffalo, for \$185,000. Aldermanic Committee on Water has reported in favor of awarding contract to Holly Mfg. Co., of Buffalo, for five 30,000,000-gal. vertical triple expansion steam pumps for Porter ave. pumping station at \$674,769; also to Northern Engineering Co., Detroit, Mich., for 30-ton electric travelling crane, \$9,950.

Youngstown, N. Y.—Water works plant, general contract, to F. E. Dean & Co., of Youngstown, \$4,789.38; erection of pumping station, to A. J. Serviss & Son, Youngstown, \$1,656.43; furnishing pipe for entire system, to U. S. Cast Iron Pipe and Foundry Co., of Buffalo, \$6,728.16; standpipe, to Tibbitt & Wood, of Phillipsburg, N. J., \$2,891; hydrant, valves and valve boxes, to Darling Pump and Mfg. Co., of Williamsport, Pa., \$1,225.

Ft. Reno, Okla.—Erection of a 60,000-gal. steel tank and trestle to replace two old wooden tanks at the Reno remount depot, to Des Moines Iron & Bridge Co., Des

Moines, Ia., \$6,300; to S. J. Wick, El Reno, 10 cisterns, \$3,987; Oklahoma Engineering Co., Anadarko, two cisterns, \$1,168.

Westerly, R. I.—Reinforced concrete standpipe, 40 ft. inside diameter, nearly 100 ft. high, to Aberthaw Construction Co., Boston, Mass.

Kent, Wash.—Constructing pipe line from the Springs, to W. H. Mitchell, Seattle, \$56,986; work comprises 40,200 ft. 14-in. pipe, 12,400 ft. 12-in. pipe, an intake at Springs, a concrete reservoir, and 550 ft. of bridging; other bids received were: More & Kible, Tacoma, \$66,921; American Contracting Co., Seattle, \$64,860; D. Swank & Co., Kent, \$62,996; Rich-Harris Co., Seattle, \$66,804; International Contracting Co., Seattle, \$94,606; McMahon Co., Kent, \$65,500; A. W. Springston, Seattle, \$64,996; C. E. Bode Co., Portland, Ore., \$63,400; Kent Construction Co., Kent, \$61,976; Gimberson Madison, Kent, \$64,599; Bones & Simpson, Kent, \$63,625; Creelman Puhman, Tacoma, \$63,446.

Calgary, Alta., Can.—Furnishing iron castings, to Alberta Iron Works.

BIDS RECEIVED

Fall River, Mass.—Furnishing a 6,000,000-gal. high-duty pumping engine, bidders as follows: Henry R. Worthington Co., New York, N. Y., \$33,000; Wm. Todd Co., Youngstown, O., two bids, \$42,400 and \$23,680; Allis-Chalmers Co., Milwaukee, Wis., \$17,800; Hoover Owens Rentschler Co., Hamilton, O., \$21,750; Epping-Carpenter Co., New York, N. Y., \$9,800; Platt Iron Works Co., Dayton, three bids, \$21,948, \$32,776 and \$43,336; Nordberg Mfg. Co., Milwaukee, Wis., \$19,465.—Jas. J. Kirby, Clerk Waputta Water Board.

New York, N. Y.—Contract U, calling for furnishing and delivering four 100-h.p. and one 150-h.p. boilers: (a) two 100-h.p. boilers for Cornwall; (b) two 100-h.p. boilers for Storm King; (c) one 150-h.p. boiler for Storm King; Ogden Iron and Steel Co., (a) and (b) \$2,400; (c) \$1,729. Erie City Iron Works, (a) and (b) \$2,350; (c) \$1,099. Edw. Burhorn (a) and (b) \$2,196; (c) \$1,089. Motley, Green & Co., (a) and (b) \$2,180; (c) \$1,080. Oil City Boiler Works, (a) and (b) \$2,388; (c) \$1,298. A. D. Granger (a) and (b) \$2,603; (c) \$1,262. P. Delaney (a) and (b) \$3,600; (c) \$1,340. Braunell Co., (a) and (b) \$2,400; (c) \$1,169. Donegan & Swift (a) and (b) \$2,213; (c) \$1,223. Godfrey Keeler, (a) and (b) \$2,146; (c) \$1,088. E. A. Cokefair (a) and (b) \$2,210; (c) \$1,100. Contract 34, calling for water mains at Jerome ave. pumping station, Bronx, 700 ft. 48-in. steel pipe, about 450 ft. 36-in. steel pipe, with a small amount of 30-in. and smaller pipe, together with valves, connections and other appurtenances: T. V. Smith Contracting Co., 215 W. 125th st., \$30,244; T. M. McLeod Co., 90 West st., \$34,475; Merrill-Ruckgaber Co., 30 Church st., \$30,456; Terry & Tench 130th st. and Lexington ave., \$32,889; T. N. Lewis, Herkimer, N. Y., \$28,493; Fox-Hennessy Co., 81 E. 125th st., \$26,859; North Eastern Construction Co., 225 5th ave., \$35,483; Chas. B. Fry, \$39,251; H. E. Fox, 81 E. 125th st., \$28,013.

Dallas, Tex.—Water pipe, 600 tons of 6-in. and 8-in. pipe: American Cast Iron Pipe Co., \$30 per ton, with \$55 per ton for specials; R. D. Wood & Co., \$29.25 per ton; General Pipe and Foundry Co., Atlanta, Ga., \$29.90 per ton for pipe and \$74.50 for specials; United States Cast Iron Pipe and Foundry Co., Chattanooga, Tenn., \$28.90 per ton for pipe and \$50 for specials; Sheffield Cast Iron Pipe and Foundry Co., Kansas City, \$28.50 per ton.

Dallas, Tex.—Hauling 5,325 tons of water pipe to be delivered between Fitzhugh and White Rock reservoir, B. L. Haley, \$1.07 per ton; J. R. Kendall, \$1.97; Edwards & Gray, \$1.25 for 24-in. and up; 80c. for other sizes.

Newton, Mass.—Bids were received by the Metropolitan Water & Sewer Board, Boston, Henry H. Sprague, Chairman, April 15, for constructing a pressure tunnel and laying water mains, etc., for the western aqueduct supply main in Newton. The bidders were: (A) Joseph Henreddy, Chicago, Ill.; (B) Coleman Bros., Chelsea, Mass.; (C) Bruno & Pettitt, Boston, Mass.; (D) Patrick McGovern, Boston, Mass.; (E) D. F. O'Connell, Boston, Mass.; (F) Luke D. Mullen, Boston, Mass.; (G) Peter F. Connolly Co., Jamaica Plain, Mass.; (H) Jones & Meehan, Boston, Mass.; (I) John J. Fa'vey, Somerville, Mass. The itemized bids were as follows:

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
950 cu. yds. top soil excavation.....	\$0.60	\$0.40	\$0.60	\$0.75	\$1.00	\$0.40	\$0.40	\$1.00	\$0.50
910 cu. yds. top soil surfacing.....	.50	.30	.50	.75	.60	.40	.40	1.00	.40
530 cu. yds. earth excavation in open trenches.....	.50	.60	1.25	.75	1.50	.50	1.50	1.30	1.00
1,700 cu. yds. rock excavation in open trenches.....	3.25	4.00	3.50	3.50	4.00	4.00	3.00	4.00	4.00
8,900 cu. yds. refilling trenches, and building embankments.....	.50	.30	.50	.35	1.00	.30	.50	1.00	.50
1,900 lin. ft. excavating tunnel.....	25.00	26.00	20.00	26.50	22.00	29.00	27.40	30.00	37.00
7,500 cu. yds. crushing stone.....	.75	.70	.80	.55	.80	.60	.70	1.00	1.00
2,300 cu. yds. concrete masonry in tunnel.....	10.00	11.00	12.00	10.50	11.00	12.00	11.00	11.00	10.00
500 cu. yds. concrete masonry in open trench.....	6.00	5.50	7.50	10.50	8.00	9.00	8.00	8.00	7.00
50 cu. yds. brick masonry.....	15.00	16.00	16.00	20.00	16.00	16.00	14.00	22.00	15.00
200 cu. yds. cement grout in tunnel.....	12.00	12.00	20.00	25.00	20.00	18.00	30.00	15.00	18.00
500 lin. ft. cement mortar lining for steel pipe.....	5.50	5.50	4.00	3.00	5.00	4.00	5.00	4.00	2.00
930 lin. ft. laying 60-in. c-i pipe.....	2.00	2.00	3.00	5.50	3.00	3.50	3.00	2.00	2.00
530 lin. ft. laying 80-in. steel pipe.....	3.00	2.50	4.00	5.50	6.00	3.00	7.45	2.00	3.00
Total.....	\$102,150	\$105,201	\$105,278	\$113,848	\$114,681	\$115,839	\$120,914	\$127,509	\$130,628

LIGHTING AND POWER

Citronelle, Ala.—H. Riedmann and associates are considering establishment of private electric light plant.

Gadsden, Ala.—Council has granted franchise to H. A. Rodgers, promoter of Nocealula Railway, Light and Power Co.

Waldron, Ark.—Plans are being prepared by E. W. Gantt, of Sequoyah Engineering Co., Fort Smith, for electric light plant.

Georgetown, Cal.—Funds are being raised to provide more street lights.

Haywards, Cal.—People's Light and Power Co. has purchased a 35-year franchise to operate its system, and will soon commence work on transmission lines from Fruitvale to Haywards.—D. U. Toffelmer, San Leandro, President.

Marysville, Cal.—Pacific Gas and Electric Co. is considering several improvements to its local gas plant at 4th and Yuba sts., chiefly new boiler, and another large storage tank with capacity of 100,000 cu. ft. of gas.

Oakland, Cal.—City Electrician George R. Babcock has begun work in the drawing up of tentative plans and specifications for an extensive gas lighting system, to be installed in lieu of present arc light system.

Paradise, Cal.—Hanscom & Kimball, of Paradise, have recently secured franchise to operate electric transmission lines over all public roads in Butte County; will erect an electric transmission system to supply electricity to the settlements along the Paradise Ridge.

Roseville, Cal.—Citizens will vote on \$10,000 bonds for erection of municipal electric light plant.

San Diego, Cal.—San Diego Consolidated Gas and Electric Light Co. is preparing plans for placing its wires underground on the principal streets.

Dover, Del.—Council has authorized Light and Water Committee to at once purchase dynamo and electrical equipment for plant.

Millsboro, Del.—Installation of electric lights will be considered.

Milton, Fla.—Citizens have voted \$5,000 bonds for electric lights.

Sylvania, Ga.—Citizens have voted \$40,000 bonds for construction of electric light plant, sewer system and water works.

Evansville, Ill.—Northwestern Gaslight & Coke Co. plans erection of \$300,000 plant.

Carthage, Ind.—F. F. Brennen has purchased Carthage light, heat and power plant, and will soon let contract for remodeling and improving the plant and for new machinery.

Coldwater, Kan.—City has employed J. S. Worley Co., Kansas City, Mo., to prepare plans and specifications for light plant.

Independence, Kan.—Council will consider needs of electric light department.

La Crosse, Kan.—Council has purchased complete outfit of Great Bend Light Co., consisting of a 150-h.p. engine, boiler, generator, transformers, lines, etc., for electric light plant; purchase, with changing of system from direct current to alternating current, will cost city in neighborhood of \$3,500.

Albany, Ky.—S. G. Smith, Senator E. Bertram and Hancock Bros. have purchased water mill and eight acres of land from J. A. Vincent, of this place, and will install lighting plant.

Boston, Mass.—Finance Commission has recommended rejection of bid of Rising Sun Street Lighting Co. unless substantial reduction is made; bid was \$23.60 per lamp.

Ironwood, Mich.—Appleyard & Sullivan have secured franchise for lighting system.

Brainerd, Minn.—City electric light plant has been destroyed by fire; loss \$40,000.

Grand Rapids, Minn.—E. P. Burch, Consulting Engineer, has recommended that village acquire water power at Prairie River Falls and transform it into electric power and electric plant.

Keewatin, Minn.—Council is reported to be considering installation of electric light plant.

Atlantic City, N. J.—Plans are being prepared by City Engineer E. D. Rightmire for underground conduit from Gardner's basin to Beach thoroughfare.

Kenilworth, N. J.—Recommendation that additional lights be placed in town has been made by Street Lighting Committee.

Somers Point, N. J.—Council has granted electric light franchise to Pleasantville Electric Lighting Co.—John M. Campbell, Mayor.

Wilson, N. Y.—Public Service Commission, Second District, has authorized the Conant-Bryant Power Co. to exercise franchise for electric lighting service in village of Wilson, Niagara County.

Cleveland, O.—Councilman French has begun inquiry into feasibility of erecting municipal gas plant.

Youngstown, O.—Installation of 150 lights on Federal st. is proposed; Merchants' Association will stand entire expense.

Amity, Ore.—The Amity Light and Power Co. is considering extension of lines to

Sheridan, Willamina, Perrydale and Ballston.—J. R. Wheeler, Manager.

Hermiston, Ore.—Electric Light and Power Co. has been formed by J. S. West, city; John Nissen and Julius Beeman, Pendleton, to construct and operate electric light plant.

Birdsboro, Pa.—Council has passed ordinance granting street rights to Birdsboro Gas Co., and indefinitely postponed action on similar one in favor of Consumers' Gas Co. of Reading.

Johnstown, Pa.—Citizens' Light, Heat and Power Co. will in near future extend its service lines to Geistown and that immediate territory.

Perkasie, Pa.—Council will grant a franchise to Highland Gas Co., and the line will be extended to other boroughs along North Penn.

Thornton, R. I.—Providence Gas Co. will extend mains along Plainfield st. in this village.

Greenville, S. C.—J. Thomas Arnold is interested in proposed organization of company with \$100,000 capital stock to establish electric light plant.

Denton, Tex.—Council has ordered erection of building for housing electric light plant. Address Mayor Poe.

Handley, Tex.—Northern Texas Traction Co. is considering construction of power house; cost \$30,000.

Midvale, Utah.—Council has decided to grant 50-year franchise to Utah County Light & Power Co. to extend line of poles through city for lighting and power purposes.

Provo, Utah.—Council has granted H. G. Blumenthal franchise to construct and maintain plant for the manufacture of gas, and the right to lay gas pipes through city streets.

Falls Church, Va.—Alexandria Electric Light Co. proposes to extend lines to Theological Seminary and then to Ballston, Clarendon and this city.—Mr. Weller, Electrical Engineer.

Edgewood, W. Va.—City and Elm Grove Railway Co. has asked for franchise for furnishing light.

New Martinsville, W. Va.—New Martinsville Heat and Power Co. has decided to expend \$10,000 for the installation of a complete set of gas engines in place of present steam engines.—J. W. Frasher, Wheeling, Manager.

Brockville, Ont., Can.—Ratepayers have voted Light and Power Department \$50,000 for improving and extending town lighting system.

Estevan, Sask., Can.—Ratepayers have passed by-law authorizing expenditure of \$25,000 for municipal electric light plant.

Lloydminster, Sask., Can.—Ratepayers have ratified by-law passed by Council granting franchise for eight years to W. Johnson for operation of electric light plant.

Regina, Sask., Can.—Ratepayers have passed electric light by-law.

CONTRACTS AWARDED

Seymour, Ind.—Lighting streets and public buildings to C. E. Layton, Toronto.

Shenandoah, Ia.—Gas holder, 75,000 cu. ft., for Peoples Gas Co., to Kerr-Murray Mfg. Co., about \$20,000.

Niagara Falls, N. Y.—Plant for U. S. Lighting & Heating Co., general contract to Snyder & Gillett.

Richmond, Va.—Overhead distributing system of municipal electric plant, to Storms & Co., Newark, N. J., about \$55,000.

Roanoke, Va.—Erection of power house for the Norfolk and Western Railway, to J. C. Nesbitt, city, \$26,000.

BIDS RECEIVED

Ft. Sill, Okla.—Constructing power plant at post: Wiring power plant, installing watt meters and installing fixtures in buildings, Kraushaar Brass Mfg. Co., St. Louis, Mo., \$7,780; constructing primary, service and street light lines, furnishing and installing cut-outs, street lamp brackets, street lamps, transformers, McCay Engineering Co., Baltimore, Md., \$10,997; furnishing and delivering all watt meters and transformers, furnishing and installing in power plant one constant-current transformer, General Electric Co. of Texas, Oklahoma City, \$2,632; two 75-h.p. and one 165-h.p., cross-compound engines with steam separators, two 50-kw. and one 110-kw., 60-cycle, 3-phase, 2300-volt, alternating-current generators, complete, with exciters, Ridgway Dynamo and Engine Co., Ridgway, Pa., \$13,400; switchboard, complete, with all instruments and connections for controlling all current, Westinghouse Electric and Mfg. Co., Baltimore, Md., \$3,863; four 150-h.p. safety water-tube boilers with breechings, smoke flues, etc., E. C. D'Yarmett, Oklahoma City, \$16,700; one 600-h.p. feed-water heater and purifier complete with oil separators, and feed-water weigher, Urbauer-Atwood Heating Co., St. Louis, Mo., \$2,450; boiler feed pumps, gauges, oil

tanks, steam and exhaust connections for engines and pumps and steam and water connections to feed-water heater, etc., Urbauer-Atwood Heating Co., St. Louis, Mo., \$6,500; one overhead hand power traveling crane, Evans, Almiral & Co., New York, N. Y., \$1,754; concrete floors machinery foundations and tracks in power house, Evans, Almiral & Co., New York, N. Y., \$2,647.

FIRE EQUIPMENT

Gadsden, Ala.—National Board of Fire Underwriters has recommended purchase of combination chemical and hose wagon, hook and ladder truck with full equipment, 1,000 ft. of new hose, six additional 1½-in. smooth nozzle playpipes and six shut-off nozzles, six hose relief valves for shut-off nozzles and full supply of wrenches, spanners and extra washes.

Colorado Springs, Cal.—Purchase of chemical truck is being considered.

Ansonia, Conn.—Fire Warden Coan is urging purchase of chemical engine for Sheldon Borough.

Fairfield, Conn.—Purchase of auto chemical engine is being considered.—Wm. Doling, Chairman Purchasing Committee.

New Haven, Conn.—Westville School District has voted to purchase auto fire engine for Thirteenth Ward.—Amos Dickerman and G. M. Griswold, Purchasing Committee.

Willimantic, Conn.—City is considering purchase of 1,000 ft. of hose, nozzles and fire tower.

Washington, D. C.—Bids will be received May 16 for furnishing combination chemical engine and hose wagon.—C. H. Rudolph, Commissioner.

Jacksonville, Fla.—Mayor Jordan is urging fire boat for river front protection.

Chicago, Ill.—City is considering erection of home for Co. No. 48.

Columbus, Ind.—Council has authorized purchase of 500 ft. of hose.

Indianapolis, Ind.—Fire Chief Coots has recommended purchase of one piece of auto apparatus; steps will be taken soon for purchase of another piece.

Council Bluffs, Ia.—Need of hook and ladder truck is being urged.

Westbrook, Me.—Remodeling of Presumpscot hose house is being considered.

Baltimore, Md.—Baltimore County Commissioners have made \$5,000 appropriation for Roland Park fire protection.

New Windsor, Md.—Town has voted \$2,500 to build engine house.

Walkersville, Md.—Town has voted to increase tax rate to provide additional funds for fire protection; Fire company will be organized.

Beverly, Mass.—Mayor Trout is considering feasibility of having auto fire apparatus.

Greenfield, Mass.—Town will purchase 500 ft. of hose.

Shelburne Falls, Mass.—Fire District has voted to purchase \$40,000 chemical engine.

Duluth, Minn.—Board of Fire Commissioners is considering purchase of auto for Chief Jos. Randall; site at 5th ave. and 8th st. has been purchased for erection of fire station.

Newark, N. J.—Included in budget of the Fire Board as tentatively agreed upon are items for eight automobiles to be used by deputy chief, battalion chiefs and two for telegraph department.

Passaic, N. J.—Bids will be readvertised for auto gig for Fire Chief.

Perth Amboy, N. J.—Erection of two fire houses is being considered; plans by Municipal Architect J. K. Jensen.

Springfield, N. J.—Fire Commissioners have asked for \$200 appropriation for purchase of hose and other necessities.

Buffalo, N. Y.—Clinton Street Business Men's Association is considering erection of fire house.

Jamestown, N. Y.—Purchase of two fire engines is being considered.

Sodus, N. Y.—Volunteer fire company has been formed. Dr. Frank L. Willson and C. F. Sutton are interested.

Columbus, O.—Council has adopted order instructing Director of Safety to erect three-door engine house on west side.

Hamilton, O.—Council has authorized Safety Director A. W. Margadant to purchase \$5,000 aerial truck.

Youngstown, O.—Chief W. N. Loller has recommended erection of fire station and purchase of water tower.

Portland, Ore.—Fire Committee is planning to erect engine house at E. 34th and Taylor sts.

Beaver Falls, Pa.—Council is considering purchase of auto fire truck.

Darby, Pa.—Town will vote on \$25,000 loan for erection of fire house and town hall.

Landesville, Pa.—Purchase of three chemical engines for use in this town and Salunga is being considered.

Philadelphia, Pa.—City has purchased site on Oak lane for erection of fire house.

Williamsport, Pa.—Supply Committee will

advertise for bids for 1,000 ft. of hose and two combination hose wagons.

Wilkesbarre, Pa.—Council is considering ordinance authorizing Fire Department Committee to advertise for village truck.

Memphis, Tenn.—City has purchased sites on which to erect two fire engine houses and police station.

Bowie, Tex.—City will erect \$15,000 fire station and city hall.

El Paso, Tex.—Fire Commission has endorsed Mayor Sweeney's recommendation for purchase of 1,000 ft. of hose.

San Antonio, Tex.—National Board of Fire Underwriters has recommended establishment of three new engine companies equipped with third-size engines and motor combination hose wagons, equipping Co. No. 2 with a first-size steamer, providing Hose Co. No. 9 with auto combination hose wagon, equipping two engine companies with plain hose wagons with chemical attachments, providing a hose wagon equipped with turret nozzle and 1,200 ft. of hose for reserve in congested district, furnishing each hose wagon with door opener, burst hose jacket, lanterns, slamese connection and two hydrant hose gates, furnishing each ladder truck with a deluge set, lanterns, hose roller and hoist, burst hose jacket, marine torch, smoke mask, rope gun and life net, extension, repairs and additions to fire alarm system.

San Antonio, Tex.—Fire Committee, Alderman Wickland Chairman, will secure site on Prospect Hill for erection of fire station.

CONTRACTS AWARDED

Dover, Del.—Chemical engine, to Wilmington Brass Works, \$721.

Baltimore, Md.—Fire station on W. Baltimore st., to R. B. Mason.—Owens & Sisco, Architects.

Passaic, N. J.—Fire equipment, to Webb Motor Fire Apparatus Co., one auto combination chemical pumping engine with 40-gal. chemical tank, cost \$7,500; to Knox Automobile Co., one auto combination chemical apparatus, cost \$4,759; to Pope-Hartford Auto Co., one auto combination chemical apparatus, cost \$4,800; to the Seagrave Co., chassis for Truck 1, cost \$5,500; chassis for Truck 2, cost \$5,000.

Yonkers, N. Y.—Furnishing two motor hose and chemical engines, to Boyo Manufacturing Co., \$9,980.

BIDS RECEIVED

Albany, N. Y.—Furnishing 12 fire alarm boxes, Fred Pierce Co., \$95 each; Gamewell Fire Alarm Co., \$100 each.

BRIDGES

Los Angeles, Cal.—Board of Public Works has directed City Engineer to prepare plans for bridge and approaches over Corroyo Seco, at Ave. 43.

Pasadena, Cal.—Los Angeles County Highway Commission has prepared plans for a bridge over Arroyo Seco at E. Colorado st.; cost about \$100,000.

Highland Park, Ill.—Plans for bridge across the ravine on Waverly ave. have been submitted to H. L. Bowen, commissioner of Public Works; bids will be invited at once; cost \$6,000.

Huntington, Ind.—Allen and Huntington County Commissioners are considering erection of two bridges.

Alma, Kan.—Plans have been prepared for erection of five concrete bridges for county.

Wichita, Kan.—Sedgwick County Board of Commissioners is considering construction of six steel and concrete bridges after July.—C. E. Messer, City Engineer.

Leesville, La.—Ward 1, Vernon Parish, has voted tax for bridge and road construction.

Walkersville, Md.—Erection of bridge across Monocacy River is being considered.—M. G. Urner is interested.

Franklin, Mass.—Appropriation, \$6,000, has been made for repair of bridges and highways.

Cheboygan, Mich.—County Commissioners have been petitioned by Detroit & Mackinac Railway Co. for permission to bridge Cheboygan River.

St. Joseph, Mo.—County Court will spend between \$16,000 and \$18,000 for culverts and bridges; plans and estimates have been prepared by County Highway Engineer L. M. Stallard and bids for the work will be asked at once; culverts are to be of concrete and of a permanent nature.

Omaha, Neb.—Council has passed ordinance for construction of viaduct and approaches on Locust st.

Nashua, N. H.—Joint Bridge Committee has had plans prepared for \$75,000 concrete bridge to connect this city and Hudson.—E. O. Hathaway, City Engineer.

Paterson, N. J.—Pompton Township Bridge and Culvert Committee has been

granted permission by Board of Freeholders to ask for bids for new culvert at Wanaque ave. and for widening Union ave. culvert.

Fulton, N. Y.—Concrete bridge is to be constructed over Tannery Creek in Hannibal st.

Herkimer, N. Y.—County is considering construction of bridge over East Creek; cost \$22,800.

Massena, N. Y.—Town has voted \$40,000 bonds for construction of bridge across Grasse River.

Lancaster, O.—County and city are considering erection of bridge over Fetter's River.

Youngstown, O.—Bids will be received by Wm. L. Davies, City Auditor, May 23 for \$46,480 bridge and paving bonds.

Guthrie, Okla.—Logan County Board of Commissioners is considering constructing 15 steel bridges.—F. R. Morgan, County Clerk.

Allentown, Pa.—Engineer Robt. S. Rathmun has prepared plans for three bridges for Lehigh County.

Beaver Falls, Pa.—County will expend about \$15,000 in repairs to bridges.

Meadville, Pa.—County Commissioners are considering use of concrete instead of steel in erection of bridge across Mead ave.

Rock Hill, S. C.—City will construct bridge across Catawba River; \$9,000 available.—J. T. Roddy, Mayor.

El Paso, Tex.—Plans for reinforced concrete viaduct to carry street railway and provide roadway over G. H. and S. A. Railroad and concrete culvert for waterway are being prepared.

Celilo, Wash.—Engineer Ralph Modjeski, 100 Jackson blvd., Chicago, will take bids at once on superstructure for bridge over Columbia River, at Celilo, for Oregon Trunk Railroad.

Conconully, Wash.—County Commissioners are considering erection of five bridges.

Charleston, W. Va.—Council is considering erection of \$95,000 bridge over Kanawha River. J. E. Norville and F. P. Grosscup are interested.

Clarksburg, W. Va.—Clarksburg and Weston Electric Railway Co. will construct five bridges.—S. L. Watson, Fairmont, President.

Delmar, Wis.—Town has decided to erect two cement bridges; plans prepared.

Superior, Wis.—County will rebuild Tower ave. bridge across Nemadji River; cost \$1,000.

CONTRACTS AWARDED

Trinidad, Col.—Two concrete bridges, to Trinidad Foundry Co., \$1,025, and Carlo Gandolo, \$10 per cu. yd.

Blsmarck, Ill.—Constructing the Woods' Ford bridge, to R. C. Spandau, Danville, \$6,500.

BIDS RECEIVED

Lima, O.—Reinforced concrete bridge over Ottawa River, Hackedorn Contracting Co., Indianapolis, Ind., \$10,026; Capital Construction Co., Columbus, \$10,630; Herman Tapp Construction Co., Fort Wayne, Ind., \$10,341; Illinois Bridge Co., Chicago, Ill., \$10,700; Valentine Heil, Lima, \$12,010; Geiger & Son, city, \$10,427.

MISCELLANEOUS

Trinidad, Col.—Bids will be readvertised for erection of band stand in Kit Carson Park.

New Haven, Conn.—Board of Finance has voted \$3,000 to be used for grading and improving playgrounds at Beaver Pond Park.

Pensacola, Fla.—Citizens will vote in June on \$50,000 bonds for establishing central market house.

Brunswick, Ga.—Purchase of hospital ambulance is being considered.

Douglas, Ga.—City will erect 2-story city hall and fire department building.

Belvidere, Ill.—Andrew Carnegie has offered to build \$17,500 library if city provides maintenance.

Mt. Vernon, Ind.—Committee, Mayor Moeller, Chairman, is investigating street flushing machines.

Wapello, Ia.—Citizens will vote November next on the erection of a new jail.

Louisville, Ky.—Board of Trade is urging installation of street signs.

Portland, Me.—Geo. Burnham, Jr., has been selected as architect for police station to be erected on Newbury st.

Lowell, Mass.—Public Buildings Department has had plans prepared for \$30,000 stable on Broadway.

Raynham, Mass.—Town has asked for bids for erection of town hall.

Breckenridge, Minn.—Erection of city hall and jail is being considered.

Montevideo, Minn.—Council has had plans prepared for construction of city jail.

Beatrice, Neb.—R. W. Grant, architect, has prepared plans for remodeling jail building.

Asbury Park, N. J.—City will expend large sum in providing well-equipped playgrounds for children of cottages and hotel guests.

Cranford, N. J.—Cranford has decided in favor of establishment of tuberculosis hospital in Union County by Board of Chosen Freeholders.

Garwood, N. J.—Council is considering \$12,000 bond issue for erection of borough hall.

Trenton, N. J.—Need of additional playgrounds is being considered.—Walter Madden, Mayor.

Albany, N. Y.—Council has passed ordinance appropriating \$20,000 to acquire lands for erection of store house and sheds for Bureau of Streets.

Dunkirk, N. Y.—Council is considering erection of public building.

Long Island City, L. I., N. Y.—Superintendent of Street Cleaning of Queens Borough, A. C. Hawkins, will begin next fall to build incinerator to consume all the garbage in the Rockaways.

Mt. Vernon, N. Y.—Board of Aldermen has voted \$1,000 for playground purposes.—Rev. R. P. Kreidler, Chairman.

Ogdensburg, N. Y.—Town is considering election May 24 on \$13,500 bonds to improve fair grounds and erect buildings.

Cincinnati, O.—Council has passed ordinances providing \$3,600 bond issue to provide comfort stations at three parks and \$2,000 bond issue for wading pool at Hanna and Lytle Parks.

Toledo, O.—Market Commission has recommended establishment of retail and wholesale city market.

Portland, Ore.—Ways and Means Committee has sold \$209,000 city improvement bonds.

Erie, Pa.—Council is considering ordinance transferring \$2,000 for purchase of street flushing wagons.

Darby, Pa.—Town will vote on \$25,000 loan for erection of town hall and fire house.

Philadelphia, Pa.—Public Playgrounds Commission has recommended creation and maintenance of system of public playgrounds and recreation centers.—J. R. C. McAllister, Chairman.

York, Pa.—Council has decided to purchase street sweeper at cost of \$1,800.

Chattanooga, Tenn.—Council has given three readings to resolution appropriating \$2,500 from the park bond funds for employing architect to outline system of parks.

Memphis, Tenn.—City has purchased sites for erection of police station and two engine houses.

Bowie, Tex.—City will erect \$15,000 city hall and fire station.

San Antonio, Tex.—Finance Committee is considering purchase of four flushing machines.

Colfax, Wash.—Plans will be considered for changing channel of Palouse River to prevent repetition of floods.—Mayor Lippitt is interested.

Medford, Wis.—Town hall has been destroyed by fire.

CONTRACTS AWARDED

Boston, Mass.—Building sea wall near Charles Elliot Circle, Revere Beach Reservation, to W. H. Ellis, 18 Tremont st., city, for concrete construction.

Fall River, Mass.—Development of portion of Maplewood Park, to A. A. Allen, \$10,822.24.

Grand Rapids, Minn.—Repairs on city hall, to L. Courtemanche.

Burlington, N. J.—Erecting city hall, to J. E. Kolster, Beverly.

Millburn, N. J.—Collecting refuse, to Jos. Petrino, only bidder.

Albany, N. Y.—Furnishing two Connelly automatic flushing machines, to Barron & Cole Co., New York, \$2,000.

Ashland, O.—Jerome Park dredge work, about 315,000 cu. yds., to J. A. Roberts, city, at 9.7c. per cu. yd.

Tarentum, Pa.—Collecting and disposing of garbage, to Tarentum Reduction Co.

Murray, Utah.—Sprinkling streets, to Jos. Woods, Milton Jones and Eugene Watts.

BIDS RECEIVED

Louisville, Ky.—Erection of stable and wagon shed on W. Jefferson st., Moody-Mitchell Co., \$26,310; George H. Rommel Co., \$26,264; Alfred Struck Co., \$26,000; George Seadler Co., \$25,915; Frey Planing Mill Co., \$24,797.

Boston, Mass.—Dredging in the upper portion of channel of Weymouth Fore River, 27,000 cu. yds., scow measurement, J. P. O'Riordan, Charlestown, 29.75c. per cu. yd.; Eastern Dredging Co., city, 33.7c.; Bay State Dredging Co., city, 34.5c.

New York, N. Y.—Reconstructing and repairing ferry structures at foot of E. 23d st., East River, Borough Manhattan, E. De V. Tompkins, 81 E. 125th st., city, lowest bidder, \$10,489.